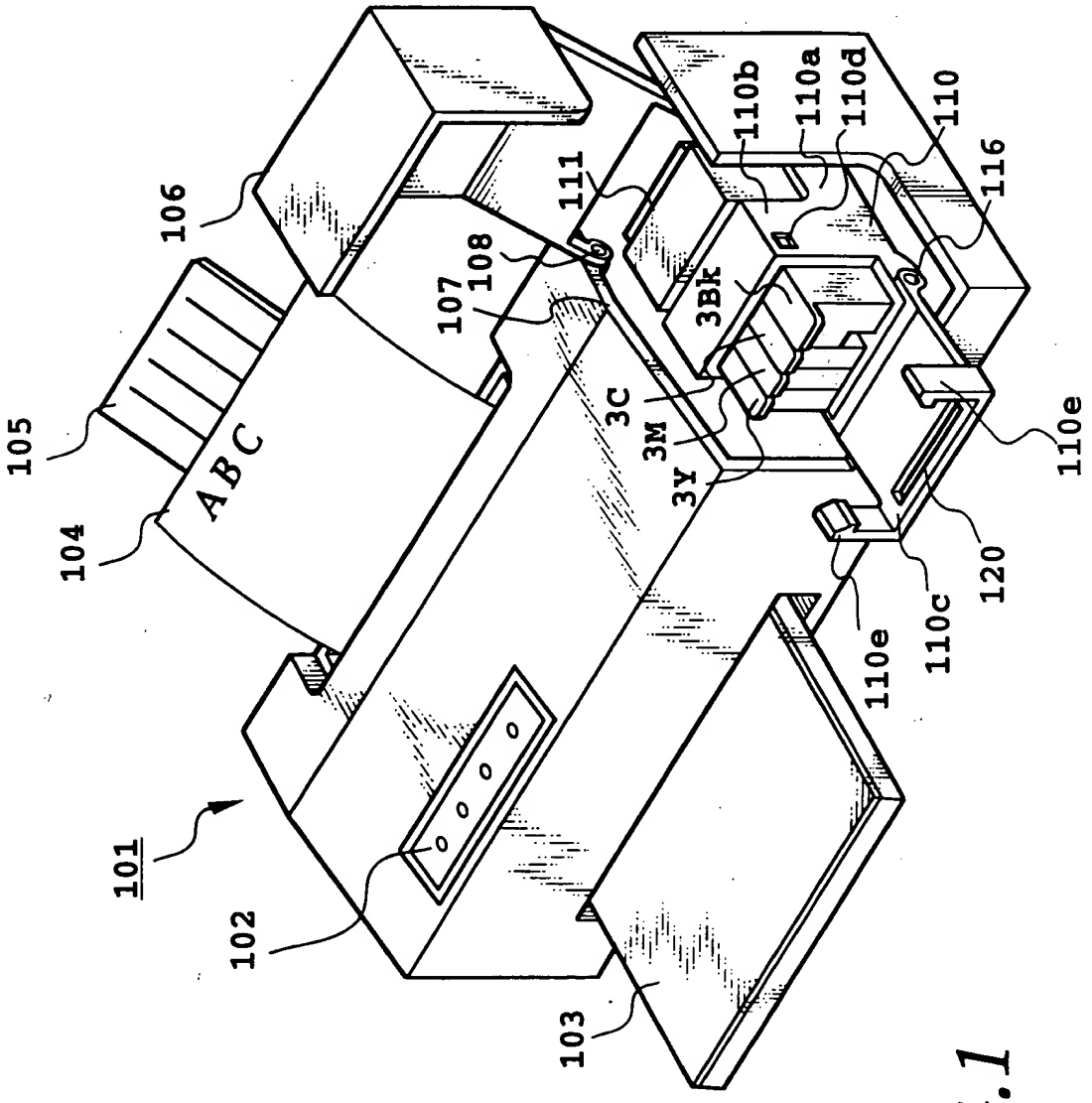

101
102
103
104
105
106
107
108
111
110b
110a
110d
110
116
3Bk
3C
3M
3Y
110e
110c
120
110e
ABC

FIG. 1

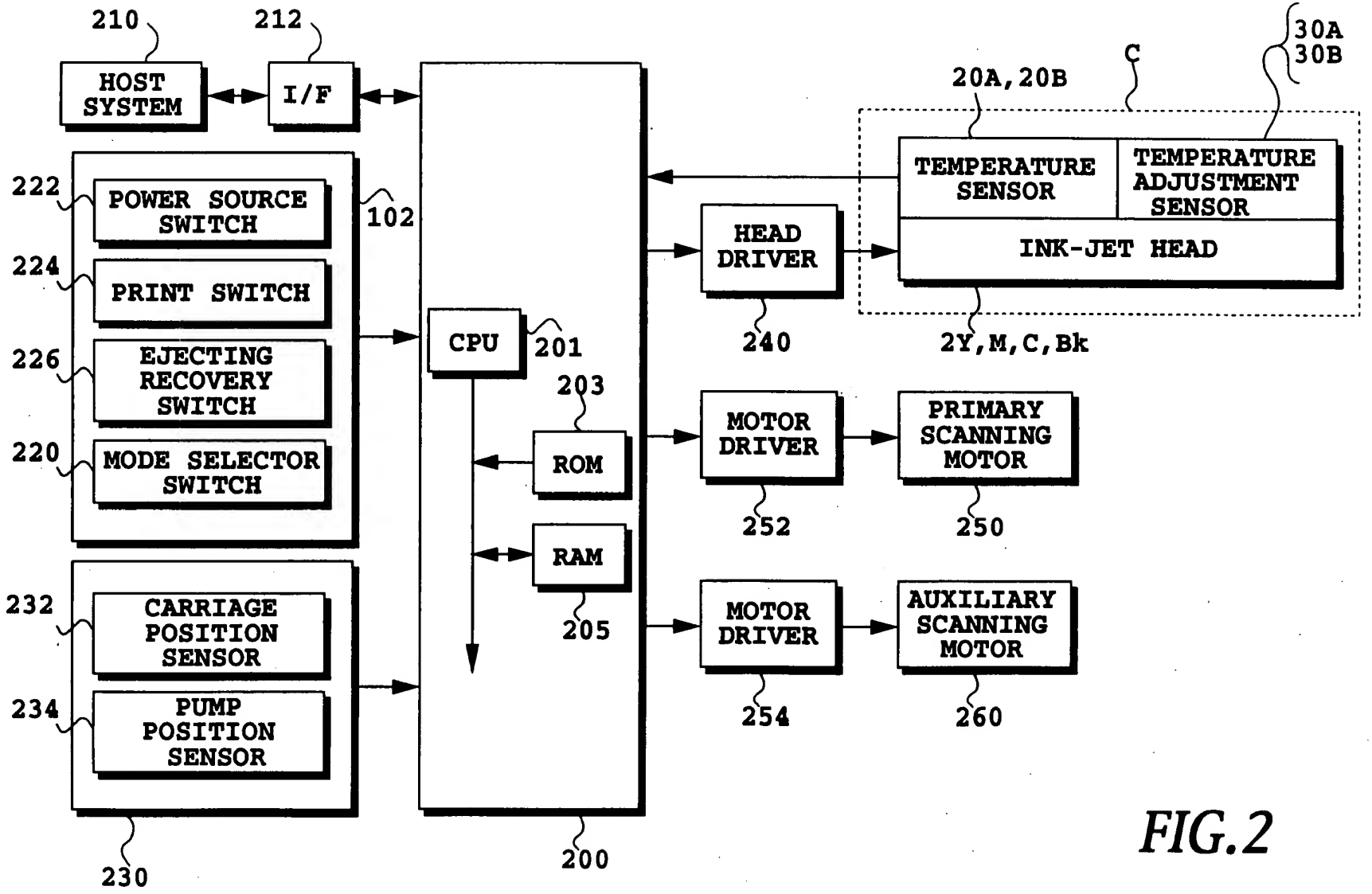

210
212
HOST SYSTEM
I/F
222
POWER SOURCE SWITCH
224
PRINT SWITCH
226
EJECTING RECOVERY SWITCH
220
MODE SELECTOR SWITCH
102
232
CARRIAGE POSITION SENSOR
234
PUMP POSITION SENSOR
230
CPU
201
203
ROM
RAM
205
200
HEAD DRIVER
240
MOTOR DRIVER
252
MOTOR DRIVER
254
C
20A,20B
30A
30B
TEMPERATURE SENSOR
TEMPERATURE ADJUSTMENT SENSOR
INK-JET HEAD
2Y,M,C,Bk
PRIMARY SCANNING MOTOR
250
AUXILIARY SCANNING MOTOR
260

FIG.2

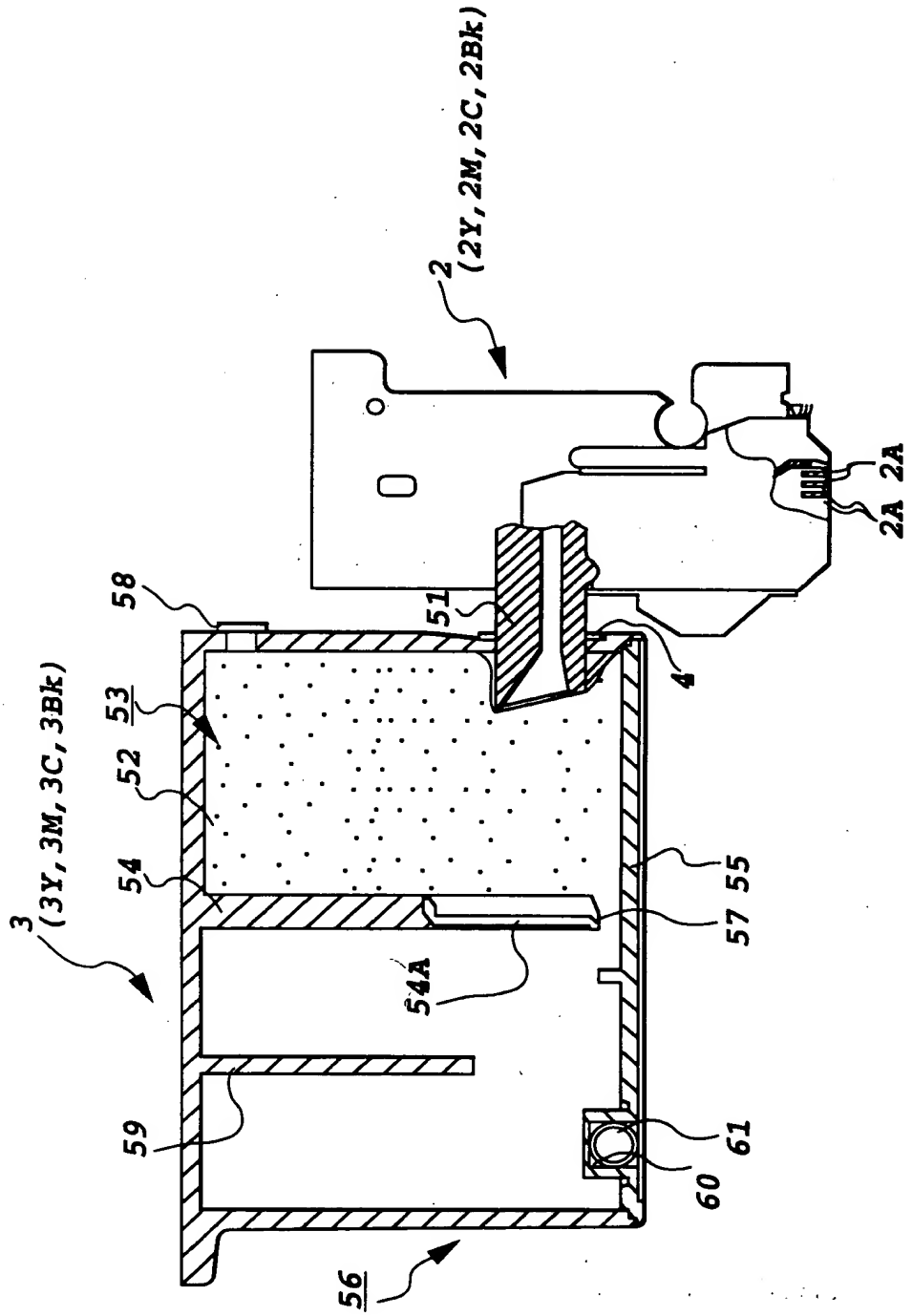

2
(2Y, 2M, 2C, 2Bk)
2A 2A
58
51
4
53
52
54
3
(3Y, 3M, 3C, 3Bk)
57 55
54A
59
61
60
56

FIG.3

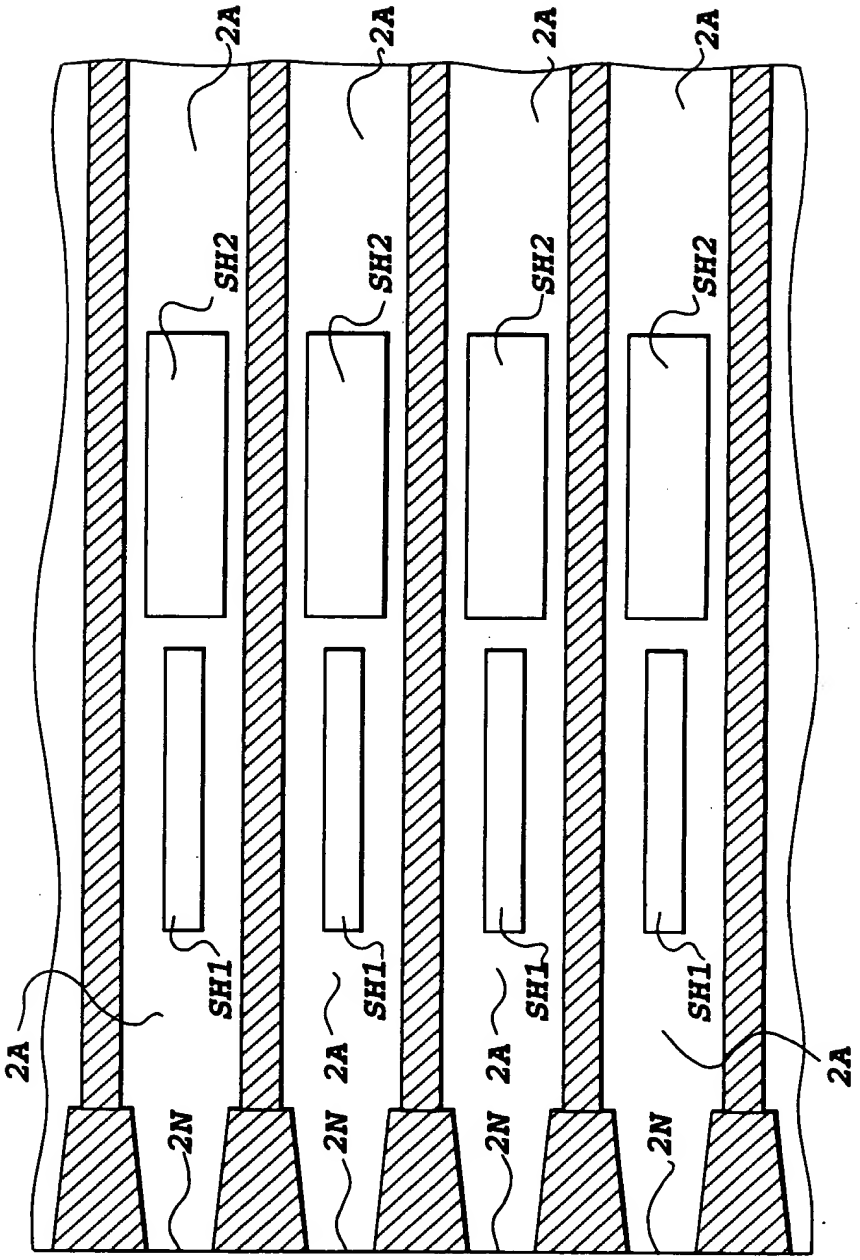


FIG.4

FIG.5

FIG.5A

FIG.5B

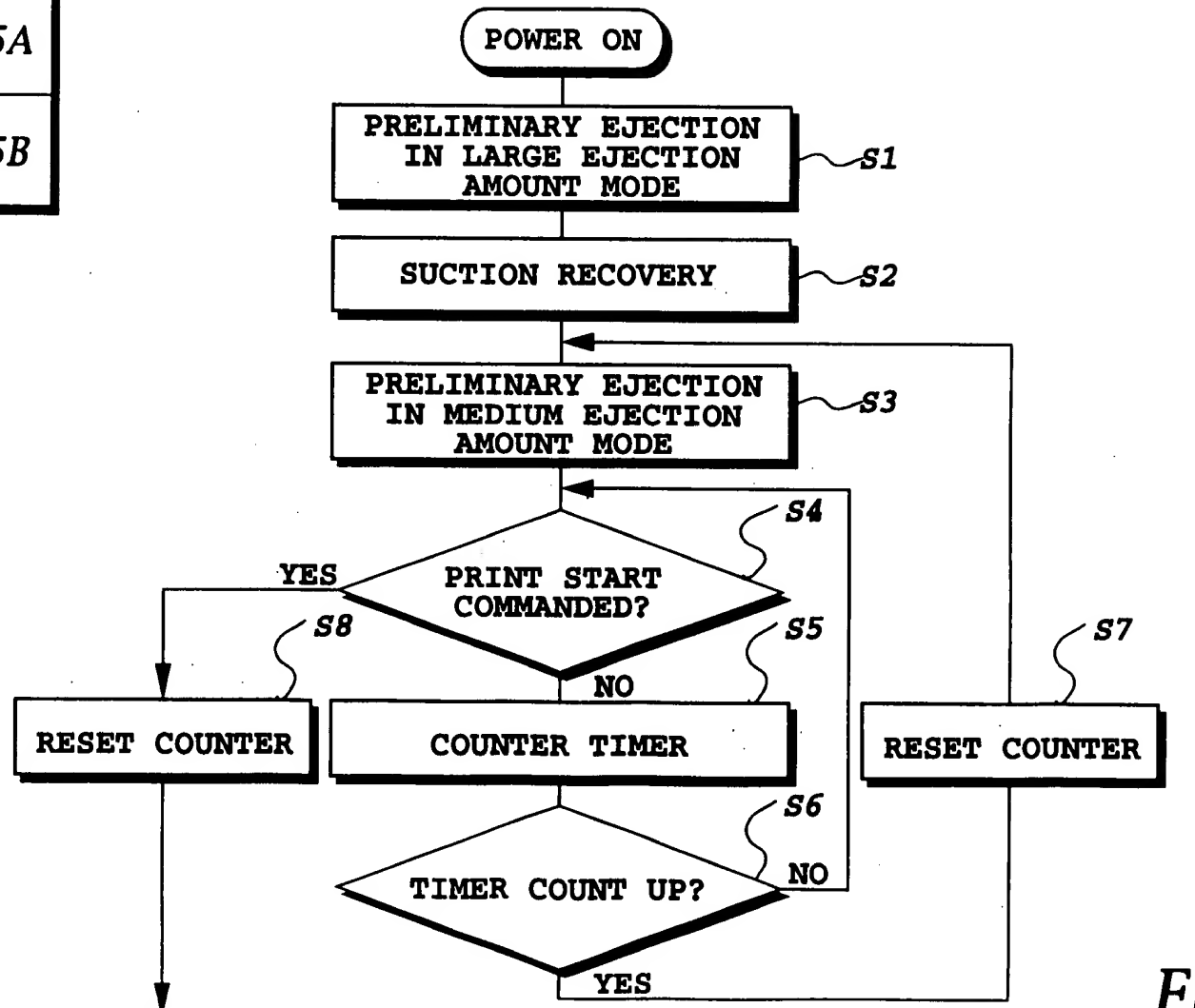


FIG.5A

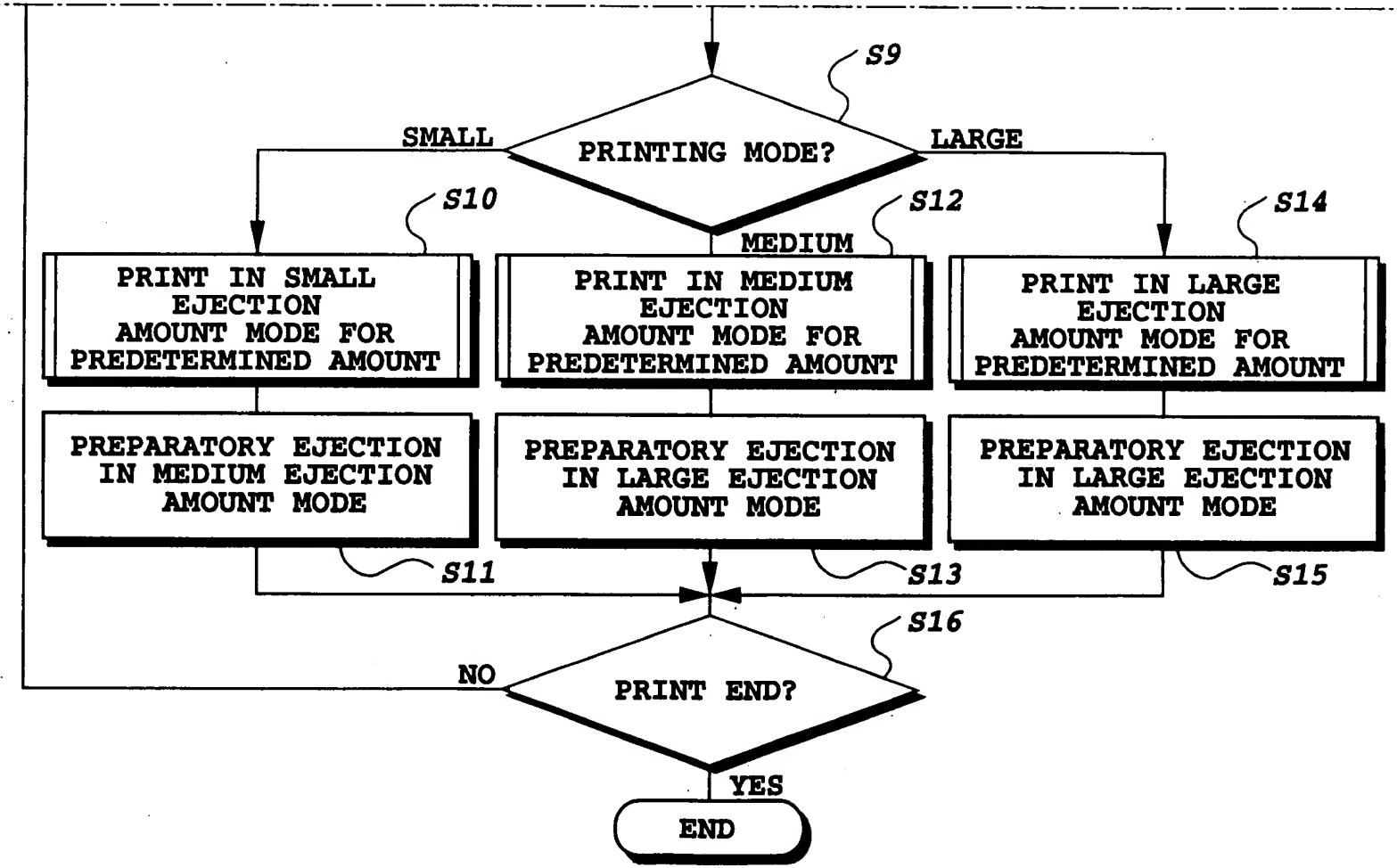

S9
PRINTING MODE?
SMALL
MEDIUM
LARGE
S10
S12
S14
PRINT IN SMALL EJECTION AMOUNT MODE FOR PREDETERMINED AMOUNT
PRINT IN MEDIUM EJECTION AMOUNT MODE FOR PREDETERMINED AMOUNT
PRINT IN LARGE EJECTION AMOUNT MODE FOR PREDETERMINED AMOUNT
PREPARATORY EJECTION IN MEDIUM EJECTION AMOUNT MODE
PREPARATORY EJECTION IN LARGE EJECTION AMOUNT MODE
PREPARATORY EJECTION IN LARGE EJECTION AMOUNT MODE
S11
S13
S15
S16
PRINT END?
NO
YES
END

FIG5B

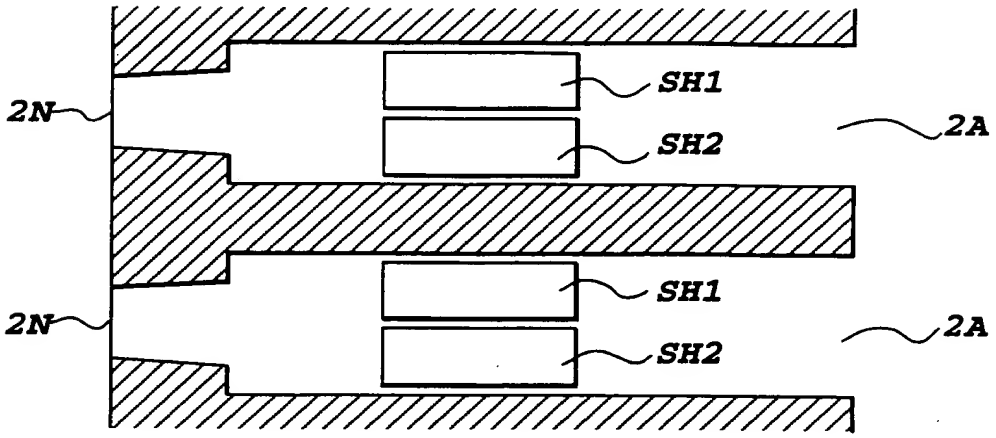


FIG.6A

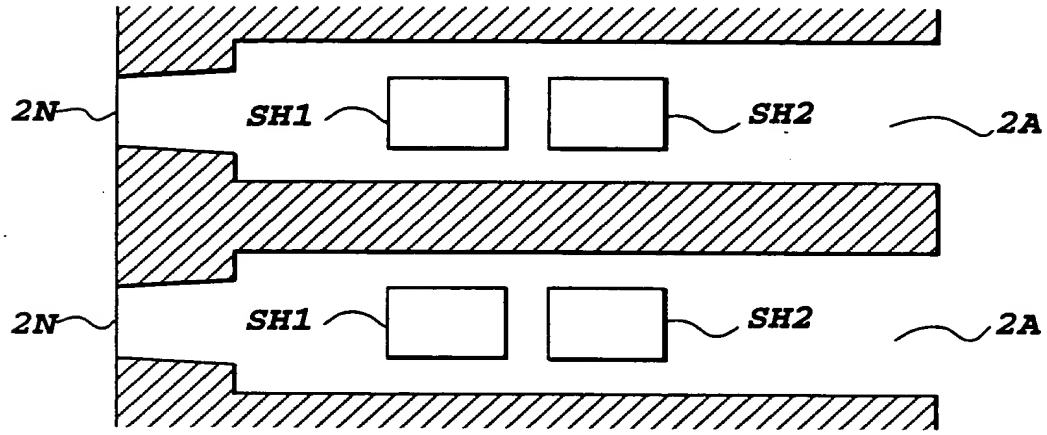


FIG.6B

FIG. 7

FIG. 7A

FIG. 7B

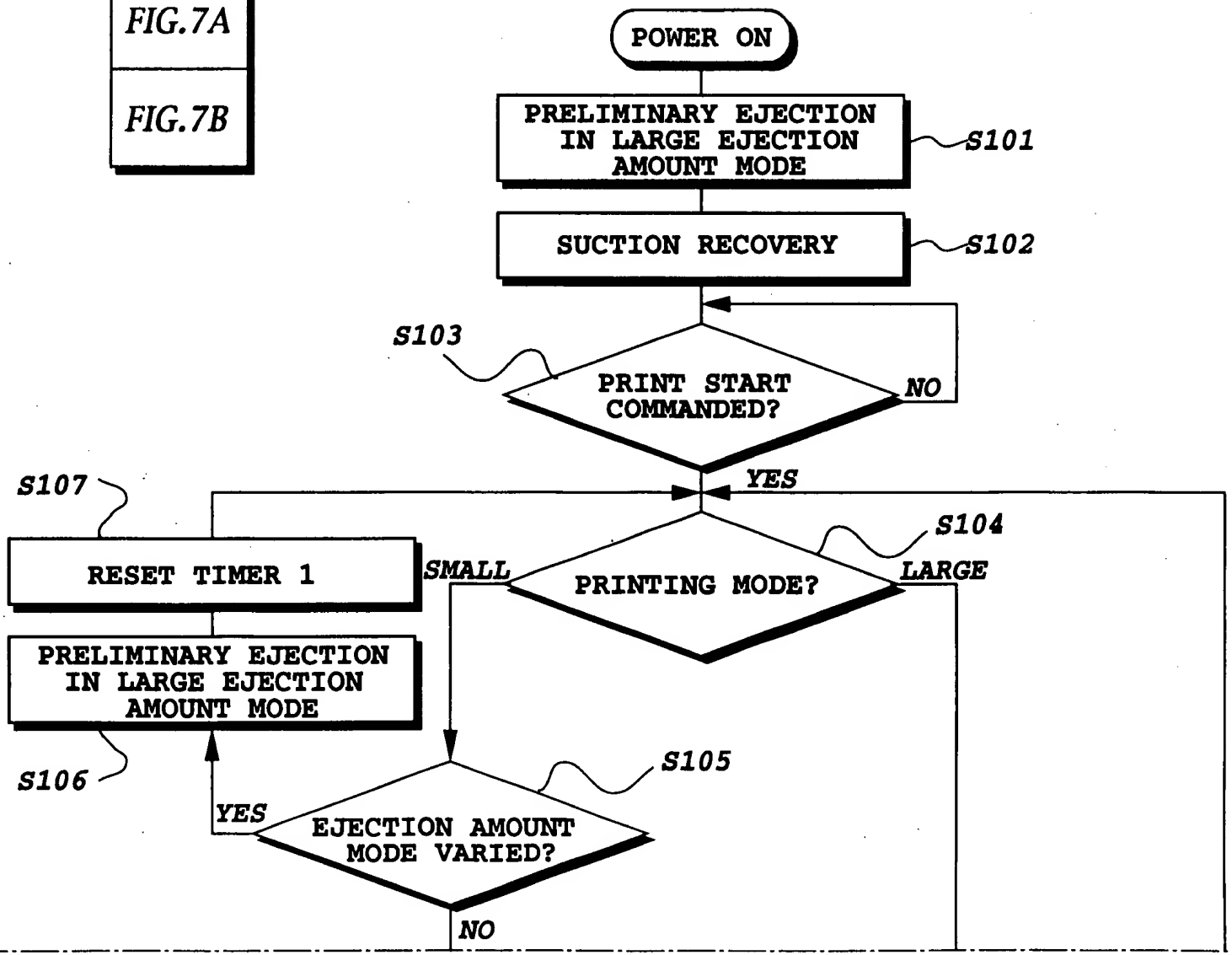


FIG. 7A

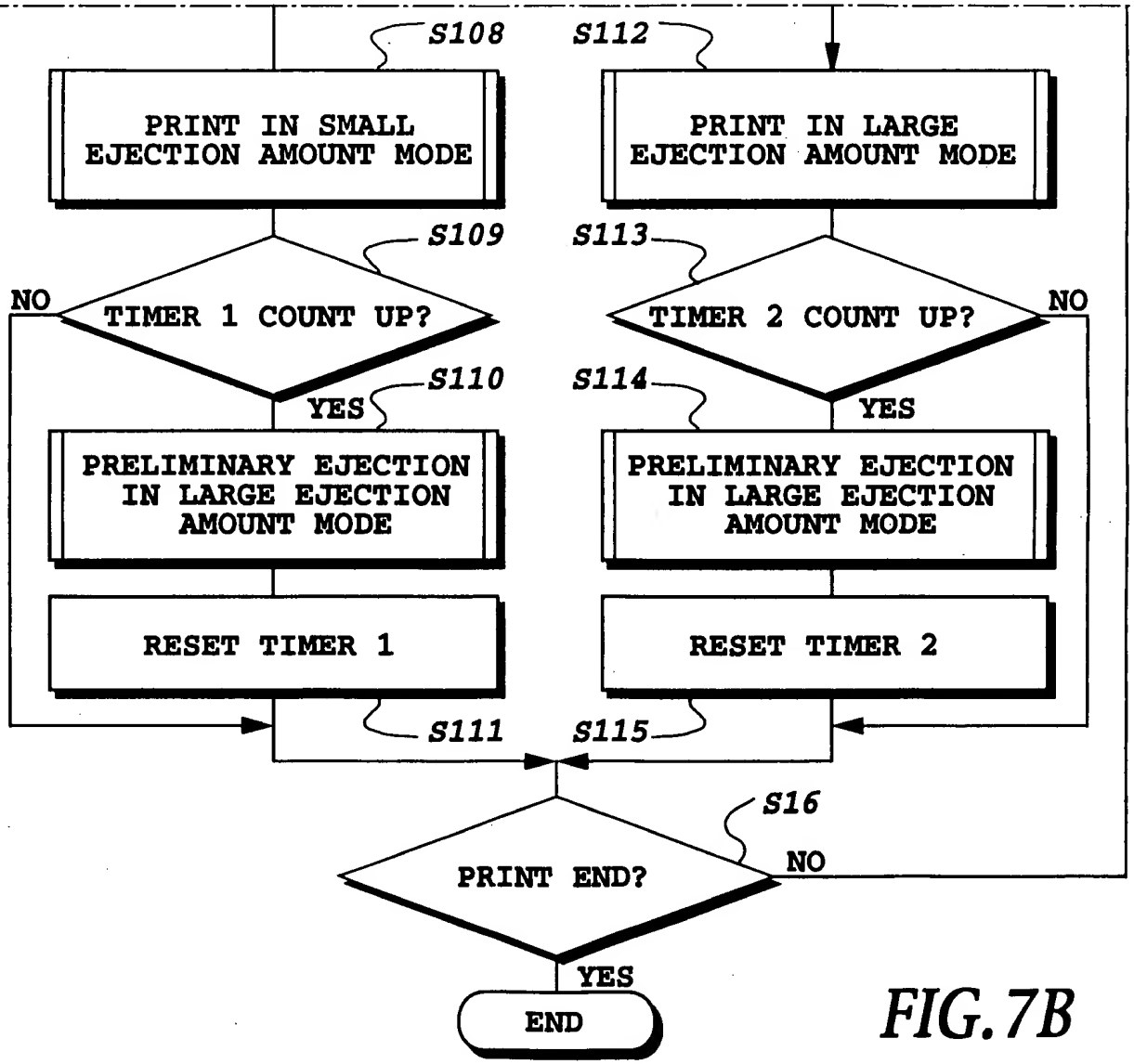

S108
PRINT IN SMALL EJECTION AMOUNT MODE
S109
TIMER 1 COUNT UP?
NO
YES
S110
PRELIMINARY EJECTION IN LARGE EJECTION AMOUNT MODE
RESET TIMER 1
S111
S112
PRINT IN LARGE EJECTION AMOUNT MODE
S113
TIMER 2 COUNT UP?
NO
YES
S114
PRELIMINARY EJECTION IN LARGE EJECTION AMOUNT MODE
RESET TIMER 2
S115
S16
PRINT END?
NO
YES
END

FIG. 7B

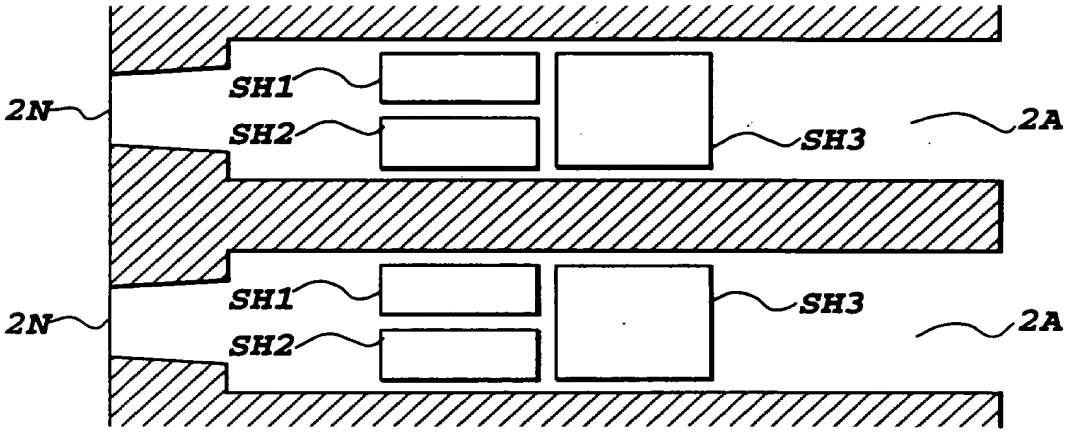


FIG. 8

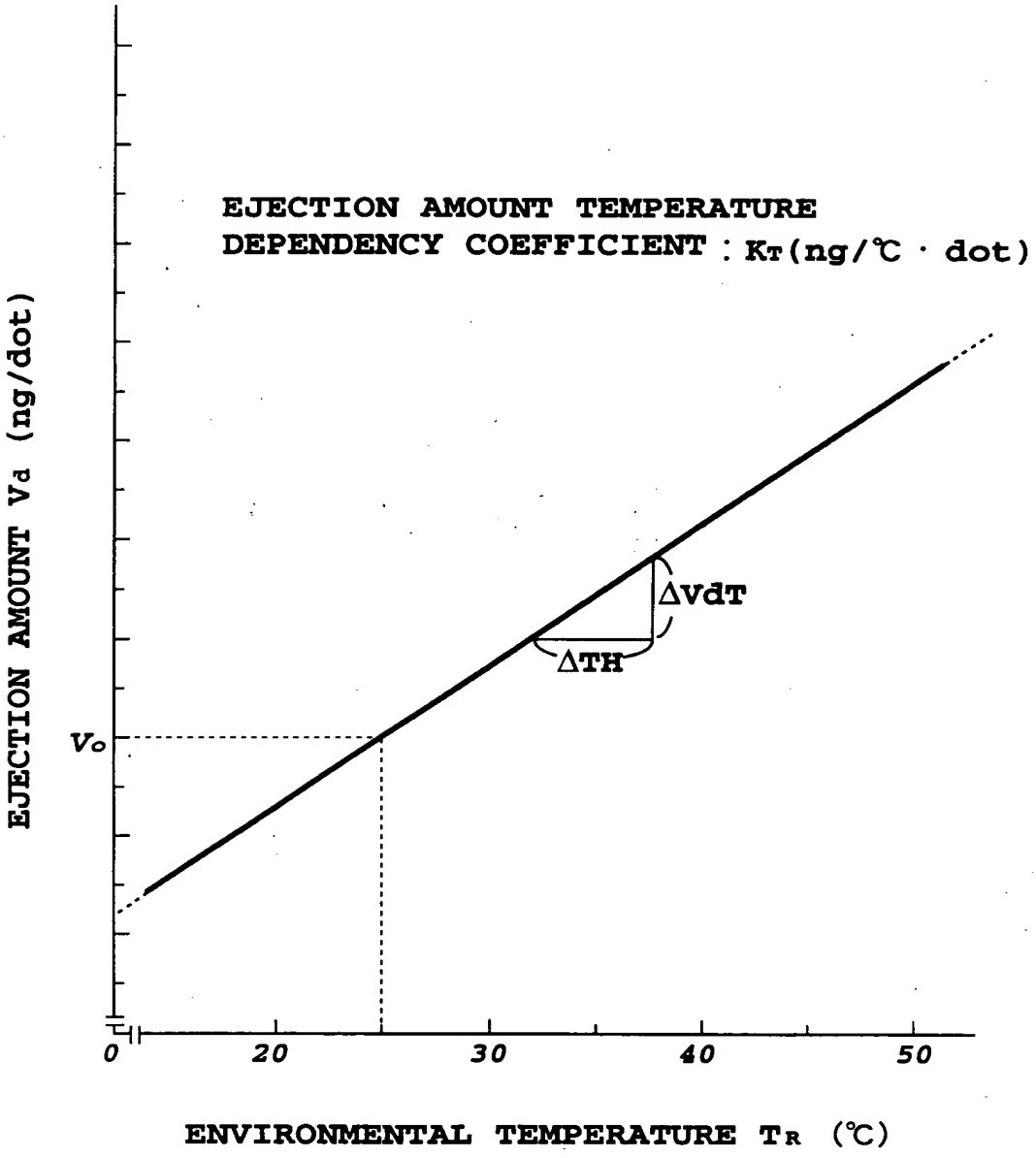

EJECTION AMOUNT TEMPERATURE
DEPENDENCY COEFFICIENT : KT(ng/℃ · dot)
EJECTION AMOUNT Vd (ng/dot)
ΔVdT
ΔTH
Vo
0
20
30
40
50
ENVIRONMENTAL TEMPERATURE TR (℃)

FIG.9

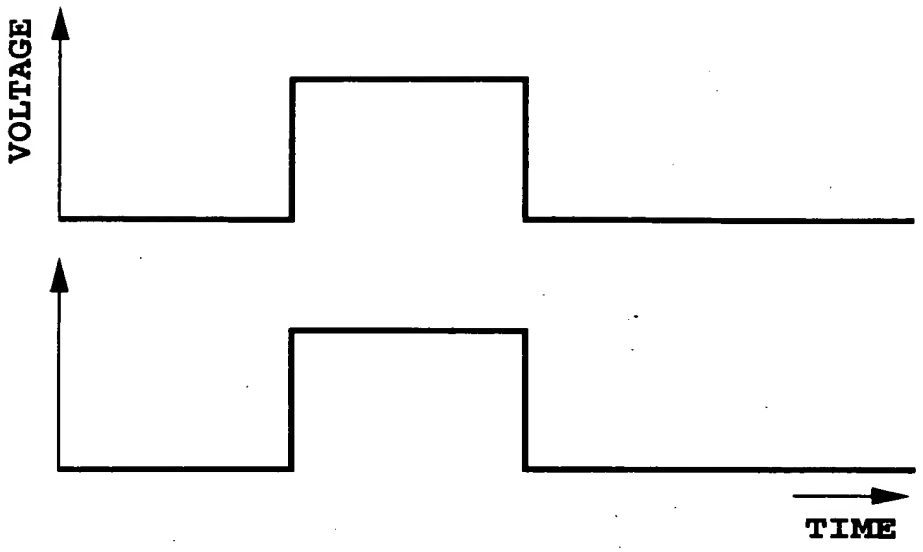


FIG.10A

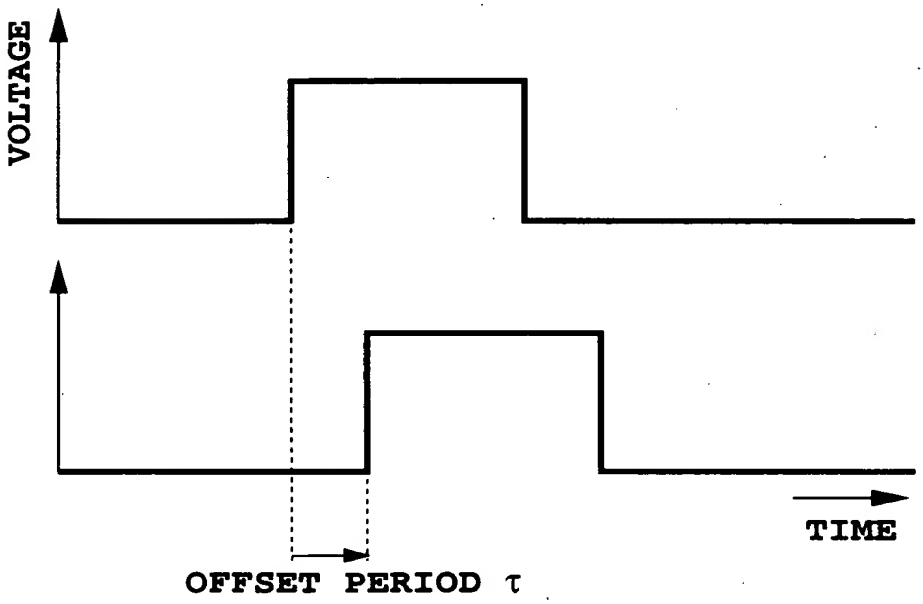


FIG.10B

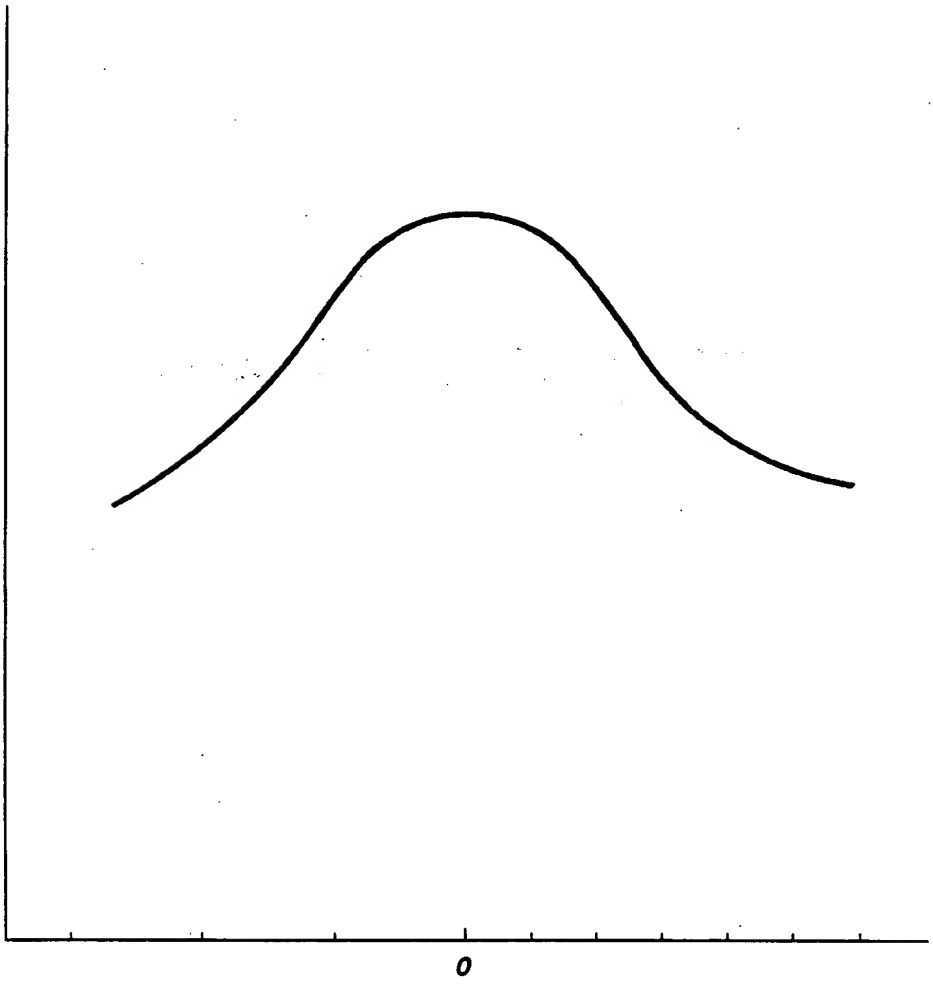


FIG.11

TOKYO 3521660

TABLE NO.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
HEAD TEMPERATURE Th (℃)	LESS THAN 26	26 OR MORE ~ LESS THAN 29	29 OR MORE ~ LESS THAN 32	32 OR MORE ~ LESS THAN 35	35 OR MORE ~ LESS THAN 38	38 OR MORE ~ LESS THAN 41	41 OR MORE ~ LESS THAN 44	44 OR MORE ~ LESS THAN 47	47 OR MORE ~ LESS THAN 50	50 OR MORE ~ LESS THAN 53	53 OR MORE
OFFSET PERIOD τ(μsec)	0	0.8	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.4	4.0

FIG.12

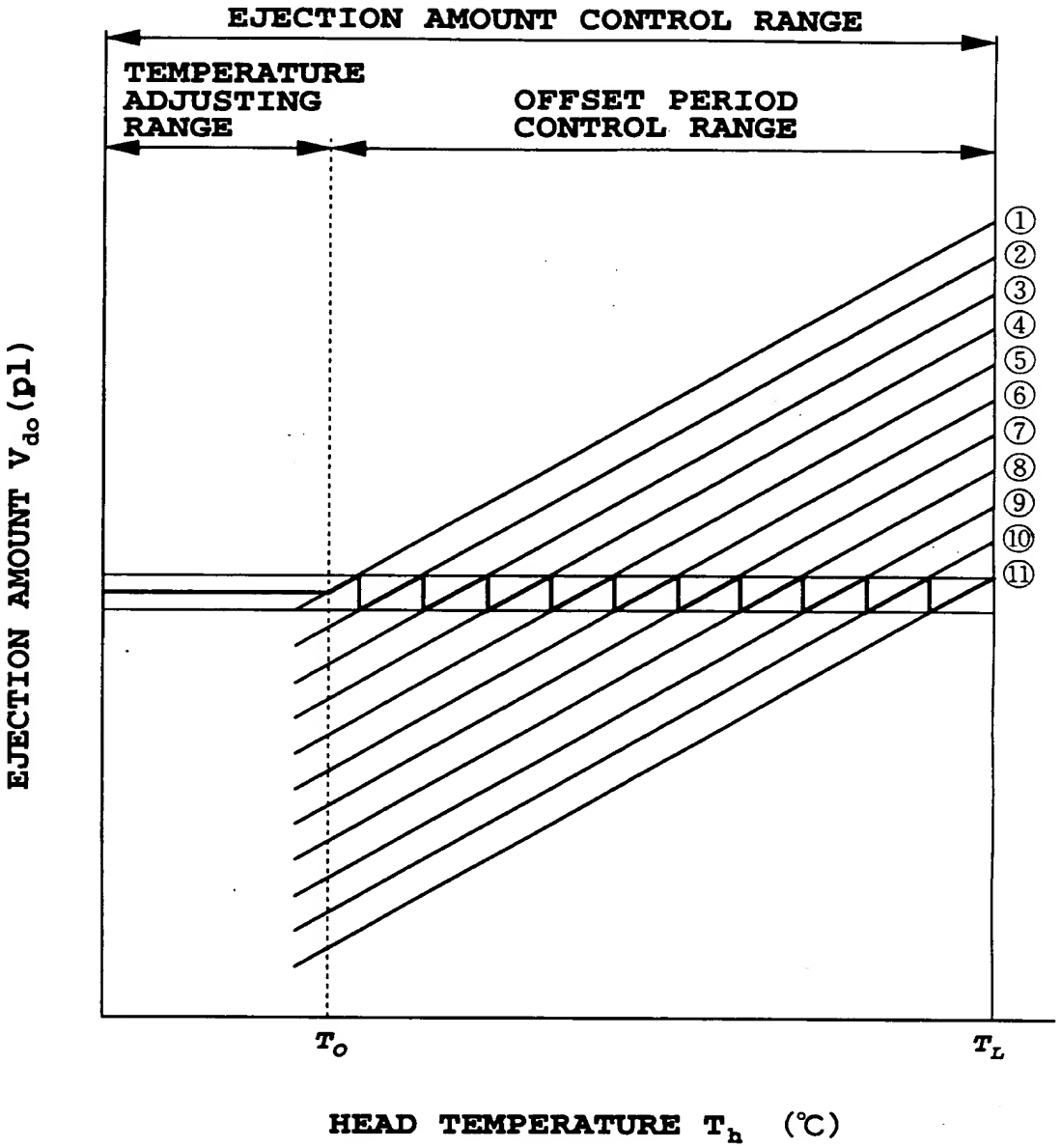

EJECTION AMOUNT CONTROL RANGE
TEMPERATURE ADJUSTING RANGE
OFFSET PERIOD CONTROL RANGE
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
EJECTION AMOUNT V_{do} (pl)
T_O
T_L
HEAD TEMPERATURE T_h (℃)

FIG.13

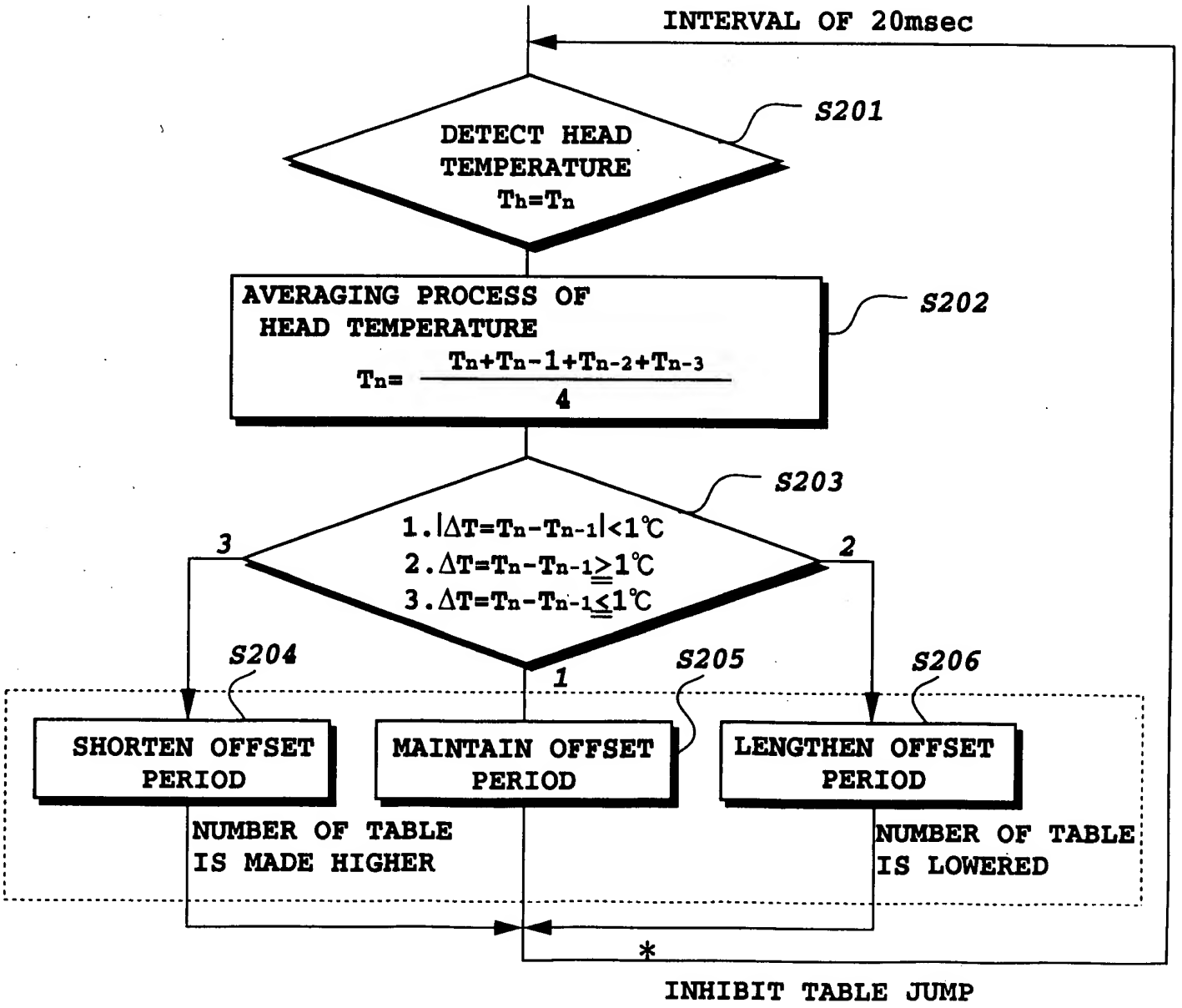

INTERVAL OF 20msec
DETECT HEAD TEMPERATURE Th=Tn
S201
AVERAGING PROCESS OF HEAD TEMPERATURE
Tn= (Tn+Tn-1+Tn-2+Tn-3)/4
S202
S203
1. |ΔT=Tn-Tn-1|<1℃
2. ΔT=Tn-Tn-1≧1℃
3. ΔT=Tn-Tn-1≦1℃
3
2
1
S204
S205
S206
SHORTEN OFFSET PERIOD
MAINTAIN OFFSET PERIOD
LENGTHEN OFFSET PERIOD
NUMBER OF TABLE IS MADE HIGHER
NUMBER OF TABLE IS LOWERED
*
INHIBIT TABLE JUMP

FIG.14

EP 0 780 232 A2

TABLE NO.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
HEAD TEMPERATURE Th (℃)	LESS THAN 26	26 OR MORE ~ LESS THAN 29	29 OR MORE ~ LESS THAN 32	32 OR MORE ~ LESS THAN 35	35 OR MORE ~ LESS THAN 38	38 OR MORE ~ LESS THAN 41	41 OR MORE ~ LESS THAN 44	44 OR MORE ~ LESS THAN 47	47 OR MORE ~ LESS THAN 50	50 OR MORE ~ LESS THAN 53	53 OR MORE
OFFSET PERIOD τ(μsec)	0	-0.8	-1.2	-1.5	-1.8	-2.1	-2.4	-2.7	-3.0	-3.4	-4.0

FIG.15

EP 0 780 235 A2

TABLE NO.	①	②	③	④	⑤	⑥	⑦	⑧
HEAD TEMPERATURE Th (℃)	LESS THAN 26	26 OR MORE ~ LESS THAN 29	29 OR MORE ~ LESS THAN 32	32 OR MORE ~ LESS THAN 35	35 OR MORE ~ LESS THAN 38	38 OR MORE ~ LESS THAN 41	41 OR MORE ~ LESS THAN 44	44 OR MORE
OFFSET PERIOD τ(μsec)	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3

FIG.16

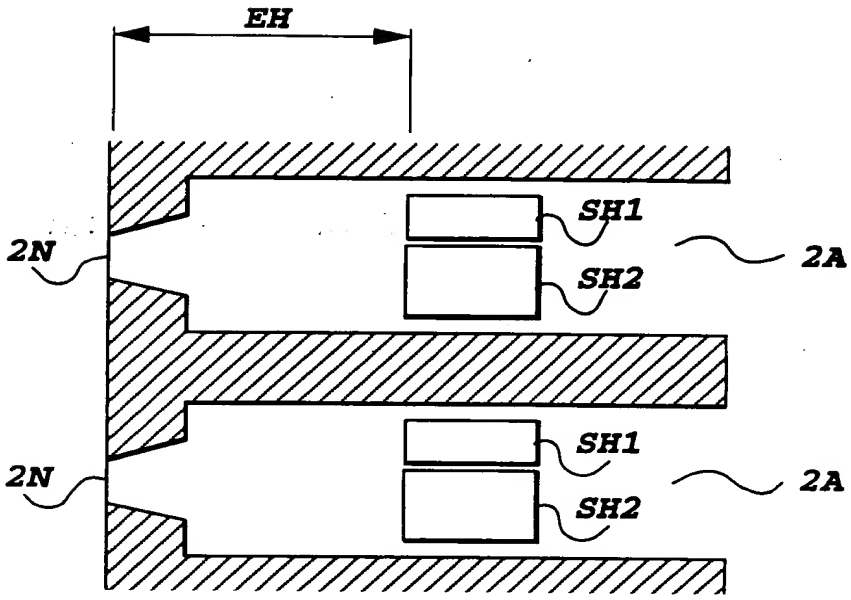


FIG.17

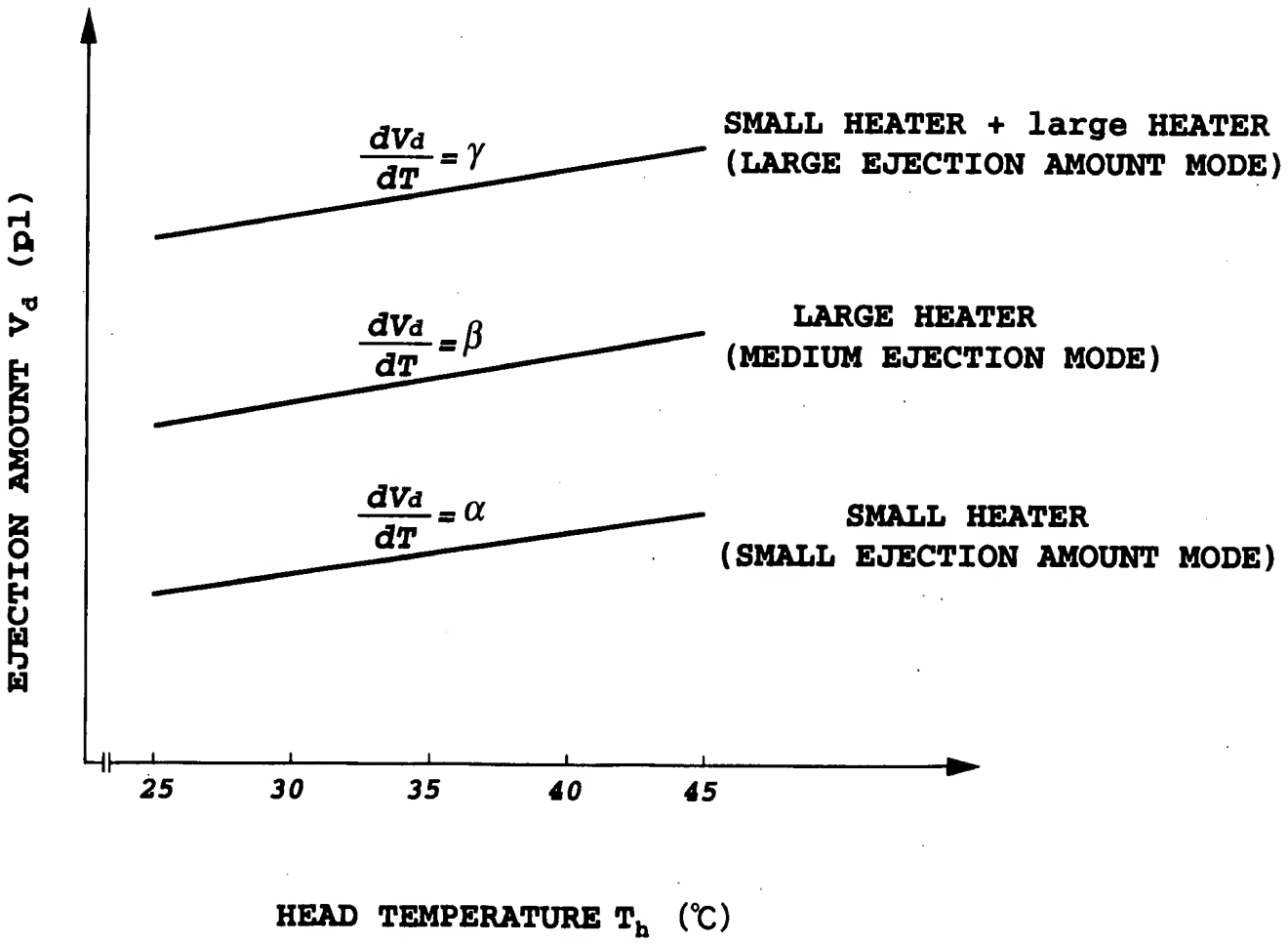

EJECTION AMOUNT V_d (pl)
$\frac{dVd}{dT} = \gamma$
SMALL HEATER + large HEATER
(LARGE EJECTION AMOUNT MODE)
$\frac{dVd}{dT} = \beta$
LARGE HEATER
(MEDIUM EJECTION MODE)
$\frac{dVd}{dT} = \alpha$
SMALL HEATER
(SMALL EJECTION AMOUNT MODE)
25
30
35
40
45
HEAD TEMPERATURE T_h (℃)

FIG.18

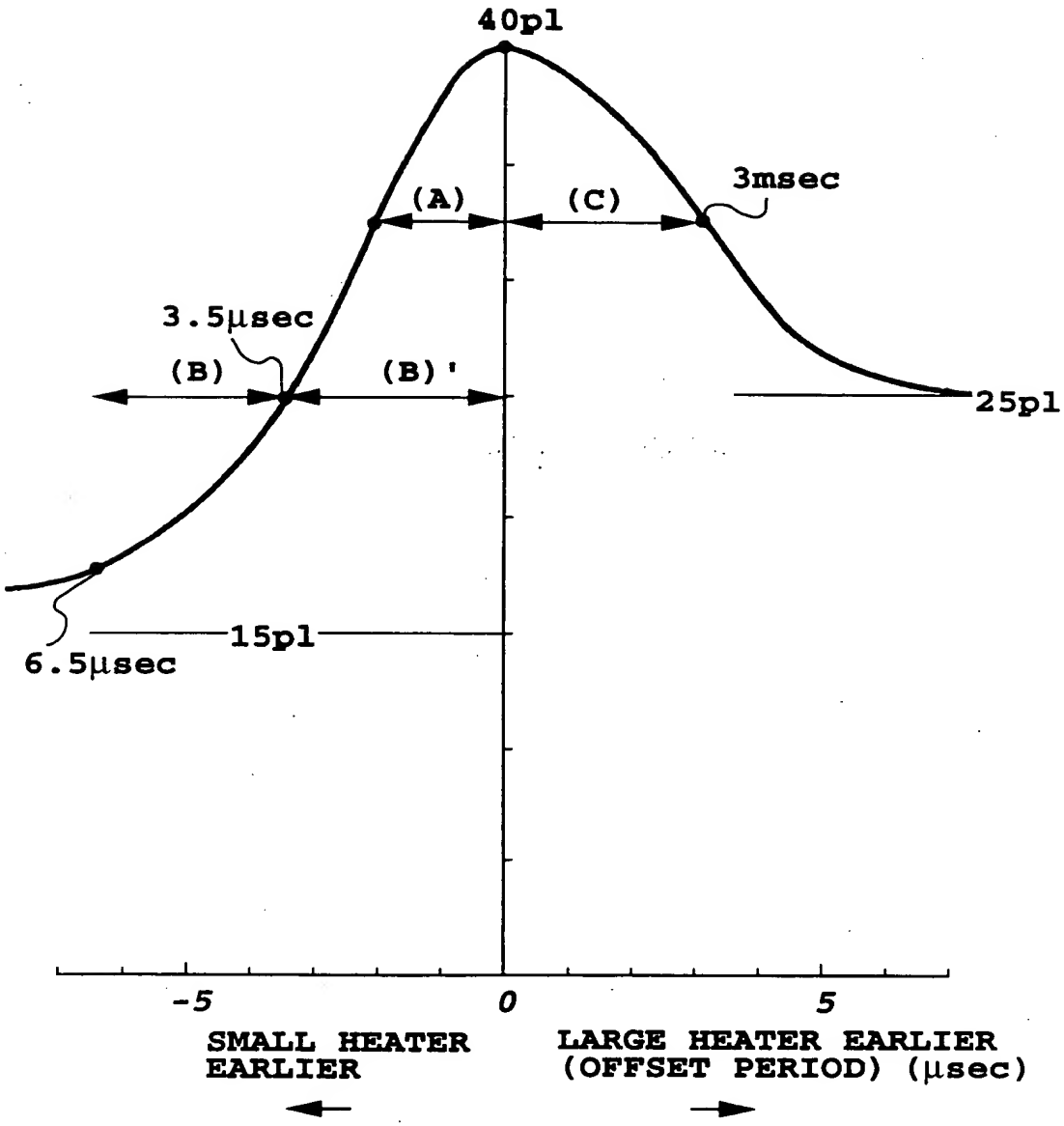

40pl
3msec
(A)
(C)
3.5µsec
(B)
(B)'
25pl
15pl
6.5µsec
-5
0
5
SMALL HEATER EARLIER
LARGE HEATER EARLIER (OFFSET PERIOD) (µsec)

FIG.19

LARGE EJECTION AMOUNT MODE (40pl/dot)

TABLE NO.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
HEAD TEMPERATURE Th (℃)	LESS THAN 26	26 OR MORE ~ LESS THAN 29	29 OR MORE ~ LESS THAN 32	32 OR MORE ~ LESS THAN 35	35 OR MORE ~ LESS THAN 38	38 OR MORE ~ LESS THAN 41	41 OR MORE ~ LESS THAN 44	44 OR MORE ~ LESS THAN 47	47 OR MORE ~ LESS THAN 50	50 OR MORE
OFFSET PERIOD τ(μsec)	0	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0

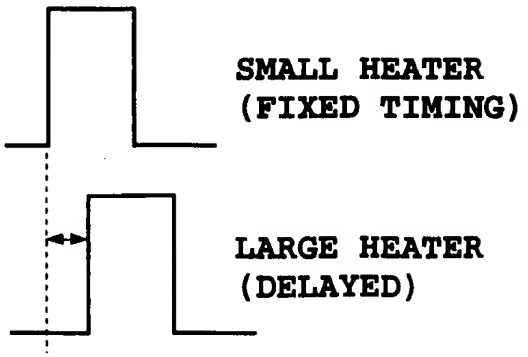


FIG.20A

MEDIUM EJECTION AMOUNT MODE (25pl/dot)

TABLE NO.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
HEAD TEMPERATURE Th (℃)	LESS THAN 26	26 OR MORE ~ LESS THAN 29	29 OR MORE ~ LESS THAN 32	32 OR MORE ~ LESS THAN 35	35 OR MORE ~ LESS THAN 38	38 OR MORE ~ LESS THAN 41	41 OR MORE ~ LESS THAN 44	44 OR MORE ~ LESS THAN 47	47 OR MORE ~ LESS THAN 50	50 OR MORE
OFFSET PERIOD τ(μsec)	3.5	3.8	4.1	4.4	4.7	5.0	5.3	5.7	6.1	6.5

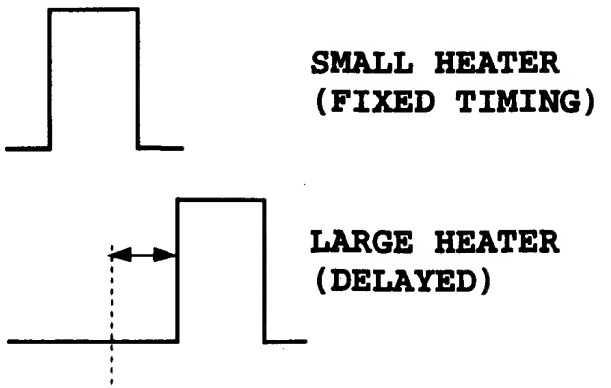


FIG.20B

EP 0 726 160 A2

LARGE EJECTION AMOUNT MODE (40pl/dot)

TABLE NO.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
HEAD TEMPERATURE Th (℃)	LESS THAN 26	26 OR MORE ~ LESS THAN 29	29 OR MORE ~ LESS THAN 32	32 OR MORE ~ LESS THAN 35	35 OR MORE ~ LESS THAN 38	38 OR MORE ~ LESS THAN 41	41 OR MORE ~ LESS THAN 44	44 OR MORE ~ LESS THAN 47	47 OR MORE ~ LESS THAN 50	50 OR MORE
OFFSET PERIOD τ(μsec)	0	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0

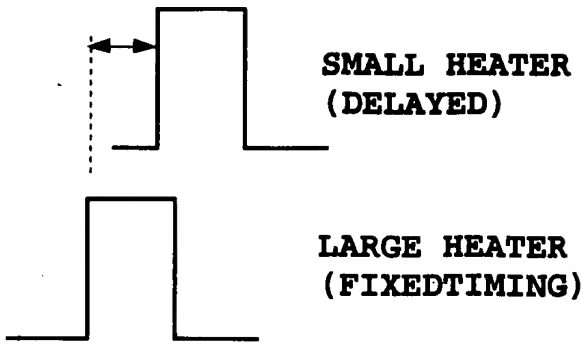


FIG.21A

EP 0 678 380 A2

MEDIUM EJECTION AMOUNT MODE (25pl/dot)

TABLE NO.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
HEAD TEMPERATURE Th (℃)	LESS THAN 26	26 OR MORE ~ LESS THAN 29	29 OR MORE ~ LESS THAN 32	32 OR MORE ~ LESS THAN 35	35 OR MORE ~ LESS THAN 38	38 OR MORE ~ LESS THAN 41	41 OR MORE ~ LESS THAN 44	44 OR MORE ~ LESS THAN 47	47 OR MORE ~ LESS THAN 50	50 OR MORE
OFFSET PERIOD τ(μsec)	3.5	3.8	4.1	4.4	4.7	5.0	5.3	5.7	6.1	6.5

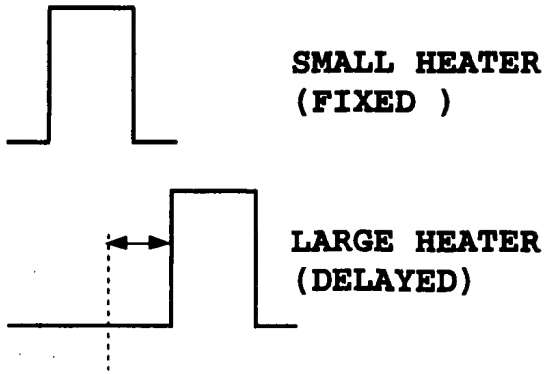


FIG.21B

SH1: SMALL HEATER
SH2: LARGE HEATER

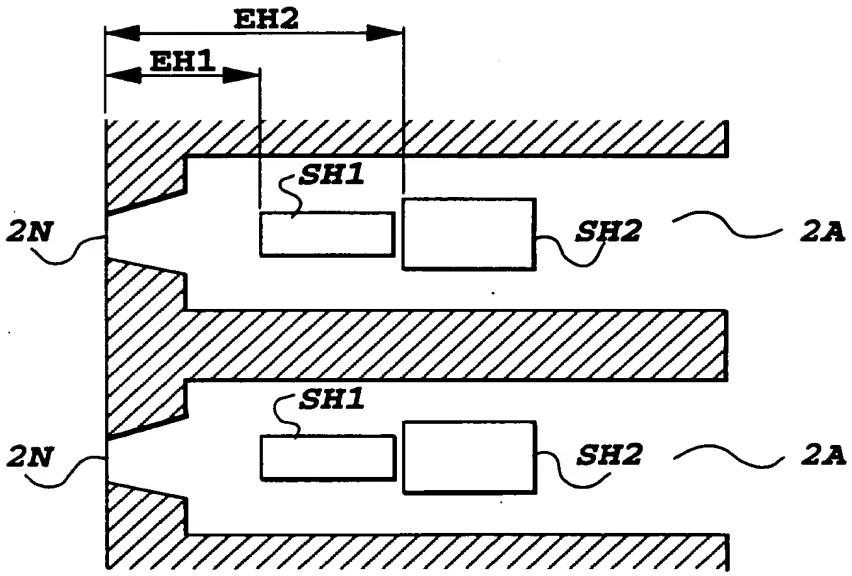


FIG.22

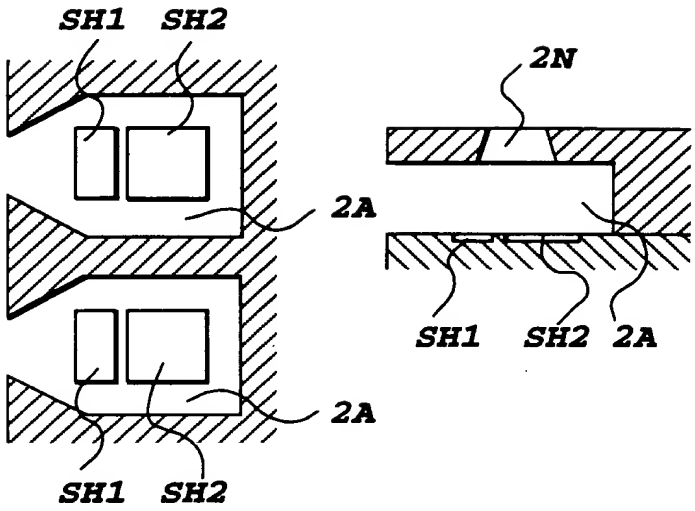


FIG.23

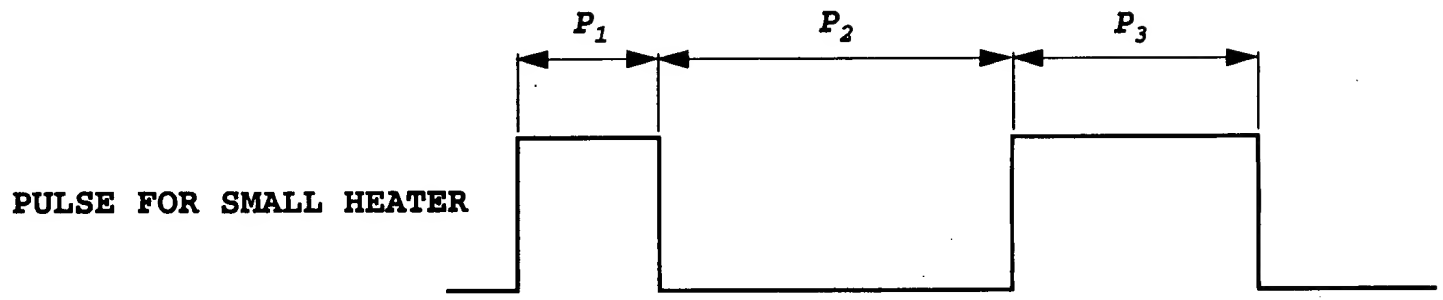


FIG.24A

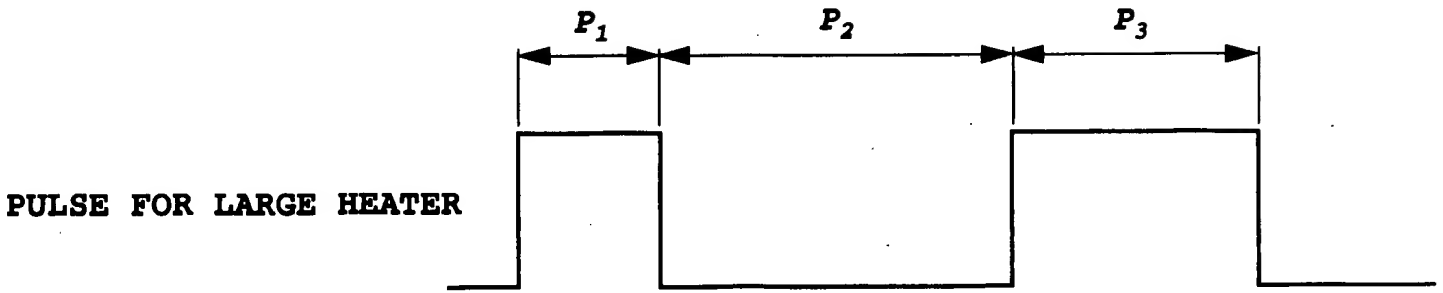


FIG.24B

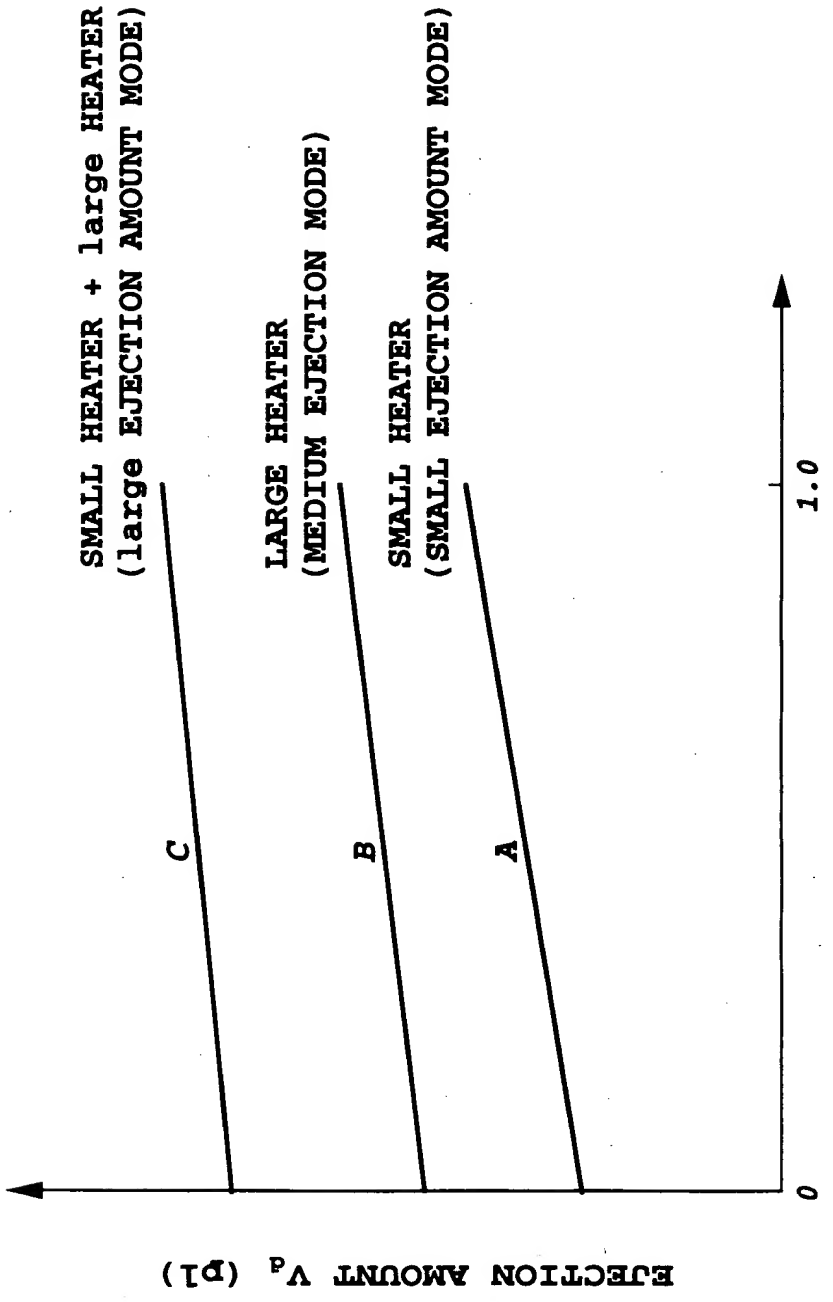

SMALL HEATER + large HEATER
(large EJECTION AMOUNT MODE)
LARGE HEATER
(MEDIUM EJECTION MODE)
SMALL HEATER
(SMALL EJECTION AMOUNT MODE)
C
B
A
0
1.0
PRE-PULSE WIDTH P1 (μsec)
EJECTION AMOUNT Vd (pl)

FIG.25

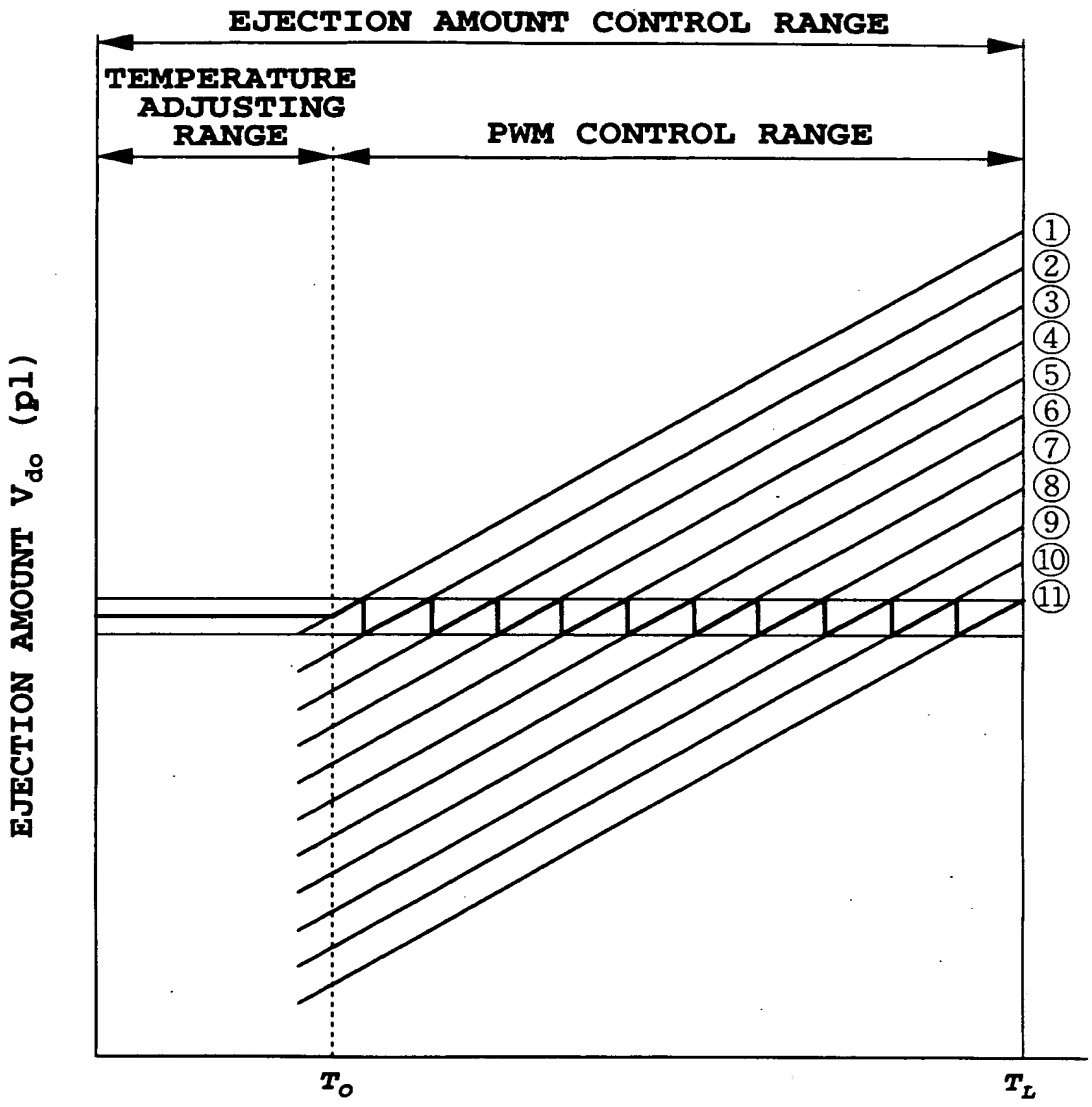

EJECTION AMOUNT CONTROL RANGE
TEMPERATURE ADJUSTING RANGE
PWM CONTROL RANGE
EJECTION AMOUNT V_{do} (pl)
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
T_O
T_L

FIG.26

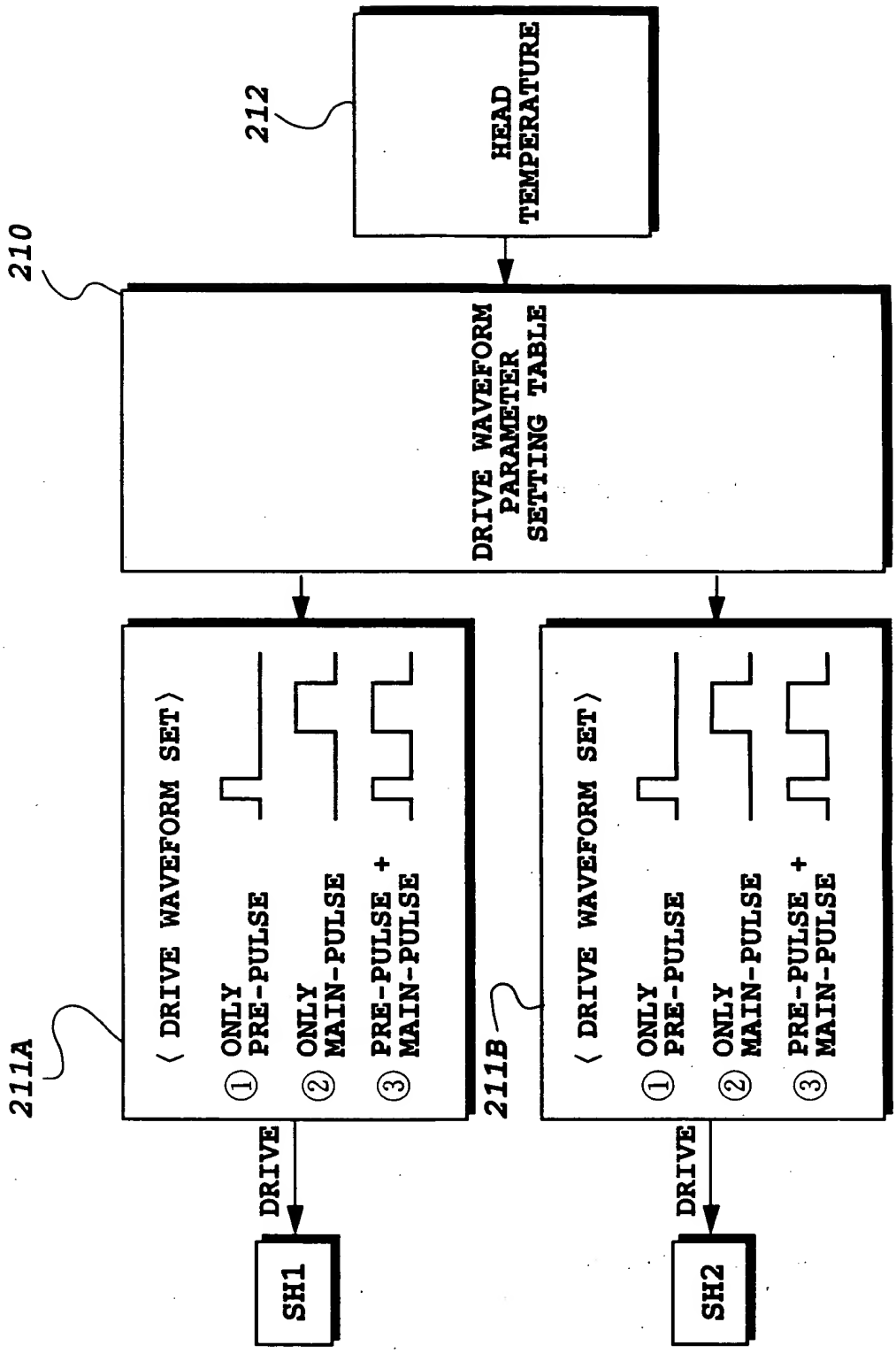

212
HEAD TEMPERATURE
210
DRIVE WAVEFORM PARAMETER SETTING TABLE
211A
〈 DRIVE WAVEFORM SET 〉
① ONLY PRE-PULSE
② ONLY MAIN-PULSE
③ PRE-PULSE + MAIN-PULSE
DRIVE
SH1
211B
〈 DRIVE WAVEFORM SET 〉
① ONLY PRE-PULSE
② ONLY MAIN-PULSE
③ PRE-PULSE + MAIN-PULSE
DRIVE
SH2

FIG.27

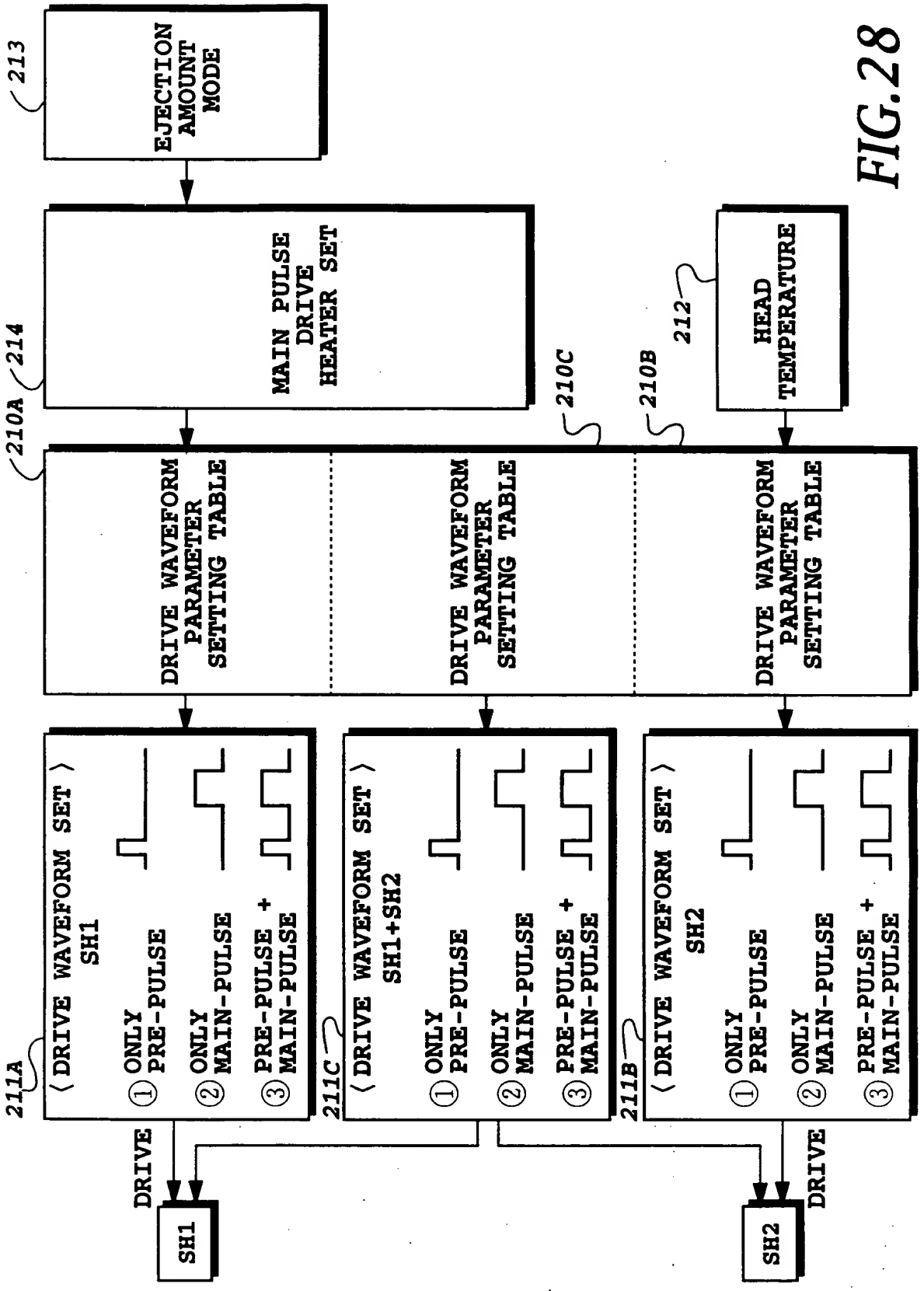

213
EJECTION AMOUNT MODE
214
MAIN PULSE DRIVE HEATER SET
212
HEAD TEMPERATURE
210A
210C
210B
DRIVE WAVEFORM PARAMETER SETTING TABLE
DRIVE WAVEFORM PARAMETER SETTING TABLE
DRIVE WAVEFORM PARAMETER SETTING TABLE
211A
〈 DRIVE WAVEFORM SET 〉
SH1
① ONLY PRE-PULSE
② ONLY MAIN-PULSE
③ PRE-PULSE + MAIN-PULSE
211C
〈 DRIVE WAVEFORM SET 〉
SH1+SH2
① ONLY PRE-PULSE
② ONLY MAIN-PULSE
③ PRE-PULSE + MAIN-PULSE
211B
〈 DRIVE WAVEFORM SET 〉
SH2
① ONLY PRE-PULSE
② ONLY MAIN-PULSE
③ PRE-PULSE + MAIN-PULSE
DRIVE
SH1
DRIVE
SH2

FIG.28

213 214

EJECTION AMOUNT MODE	MAIN HEAT PULSE DRIVEN HEATER	PRE-HEAD PULSE DRIVEN HEATER
SMALL	SH1	SH1
		SH2
		SH1+SH2
MEDIUM	SH2	SH1
		SH2
		SH1+SH2
LARGE	SH1+SH2	SH1
		SH2
		SH1+SH2

FIG.29

P_1 TABLE FOR SMALL EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER PRE-PULSE (μsec)	1.0	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10
LARGE HEATER PRE-PULSE (μsec)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(15pl)

FIG.30A

P_1 TABLE FOR MEDIUM EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER PRE-PULSE (μsec)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LARGE HEATER PRE-PULSE (μsec)	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0	0	0	0	0	0	0	0	0

(25pl)

FIG.30B

EP 0 478 360 A2

P_1 TABLE FOR LARGE EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER PRE-PULSE (μsec)	1.0	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10
LARGE HEATER PRE-PULSE (μsec)	1.0	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10

(40pl)

FIG.30C

(FOR SMALL EJECTION AMOUNT MODE)

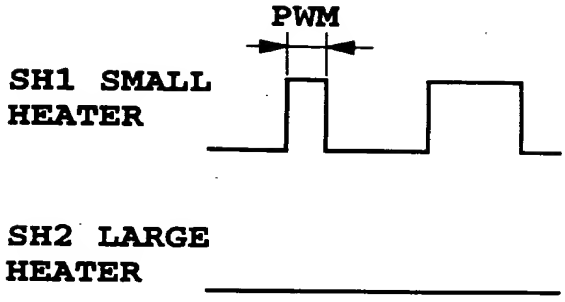


FIG.31A

(FOR MEDIUM EJECTION AMOUNT MODE)

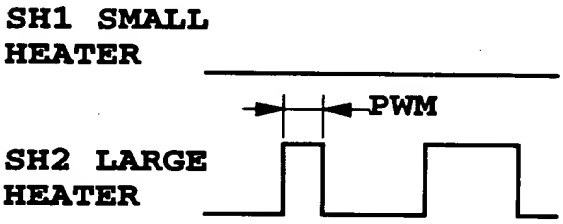


FIG.31B

(FOR LARGE EJECTION AMOUNT MODE)

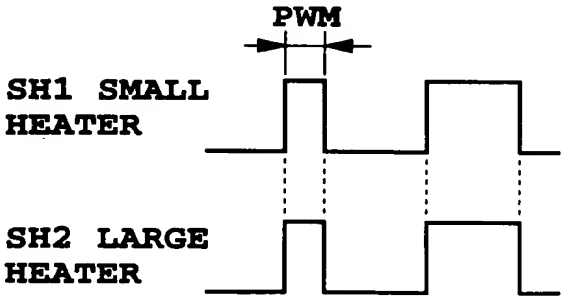


FIG.31C

P_1 TABLE FOR SMALL EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER PRE-PULSE (μsec)	1.0	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10
LARGE HEATER PRE-PULSE (μsec)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(15pl)

FIG.32A

P_1 TABLE FOR MEDIUM EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER PRE-PULSE (μsec)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.6	0.4	0.2	0	0	0	0
LARGE HEATER PRE-PULSE (μsec)	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0	0	0	0	0	0	0	0	0

(25pl)

FIG.32B

P_1 TABLE FOR LARGE EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER PRE-PULSE (μsec)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2
LARGE HEATER PRE-PULSE (μsec)	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0	0	0	0	0	0	0	0	0

(40pl)

FIG.32C

(FOR SMALL EJECTION AMOUNT MODE)

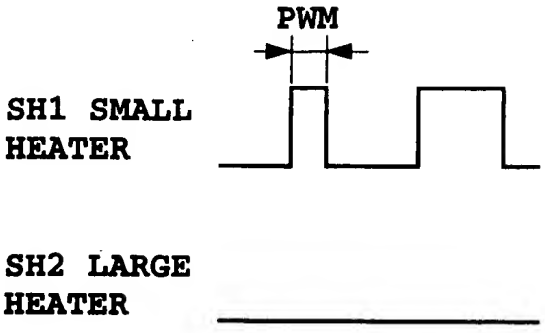


FIG.33A

(FOR MEDIUM EJECTION AMOUNT MODE)

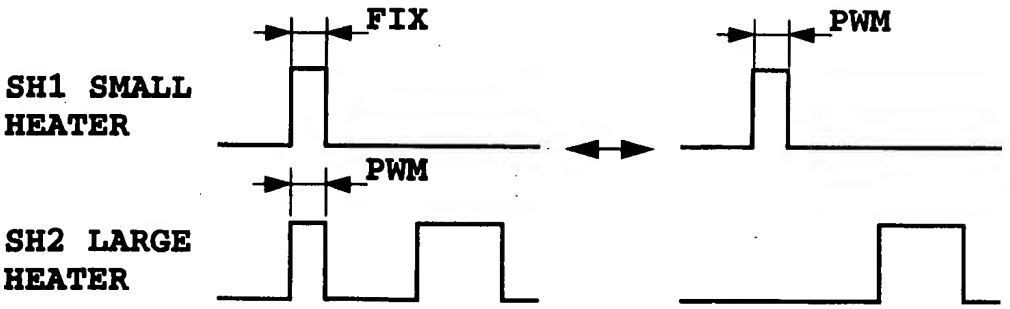


FIG.33B

(FOR LARGE EJECTION AMOUNT MODE)

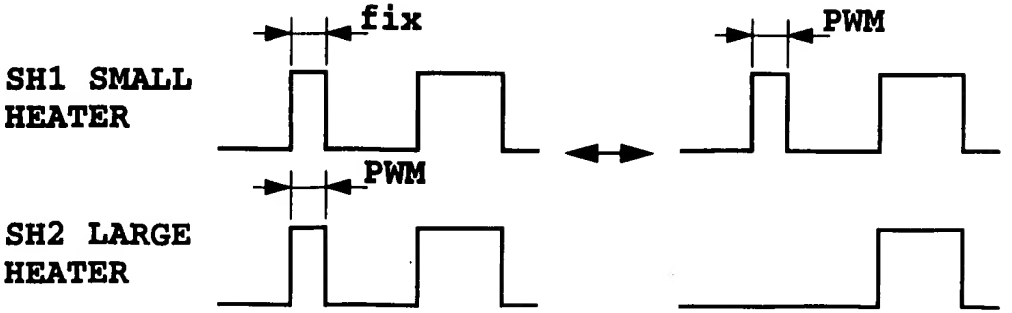


FIG.33C

P_1 TABLE FOR SMALL EJECTION AMOUNT MODE
(FOR LOW TEMPERATURE)

HEAD T TEMPERATURE (℃)	~16	~18	~20	~22	~24	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	50~
SMALL HEATER PRE-PULSE (μsec)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LARGE HEATER PRE-PULSE (μsec)	2.0	1.93	1.86	1.8	1.73	1.66	1.6	1.53	1.46	1.4	1.33	1.26	1.2	1.13	1.06	1.0	0.93	0.87	0.80

(15pl)

FIG.34A

P_1 TABLE FOR MEDIUM EJECTION AMOUNT MODE
(FOR LOW TEMPERATURE)

HEAD T TEMPERATURE (℃)	~16	~18	~20	~22	~24	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	50~
SMALL HEATER PRE-PULSE (μsec)	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6	0.4	0.2	0	0	0	0
LARGE HEATER PRE-PULSE (μsec)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(25pl)

FIG.34B

P_1 TABLE FOR LARGE EJECTION AMOUNT MODE
(FOR LOW TEMPERATURE)

HEAD T TEMPERATURE (℃)	~16	~18	~20	~22	~24	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	50~
SMALL HEATER PRE-PULSE (μsec)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LARGE HEATER PRE-PULSE (μsec)	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2

(40pl)

FIG.35A

EP 0 678 380 A2

P_1 TABLE FOR LARGE EJECTION AMOUNT MODE
(FOR HIGH TEMPERATURE)

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER PRE-PULSE (μsec)	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0
LARGE HEATER PRE-PULSE (μsec)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(40pl)

FIG.35B

(FOR SMALL EJECTION AMOUNT MODE)

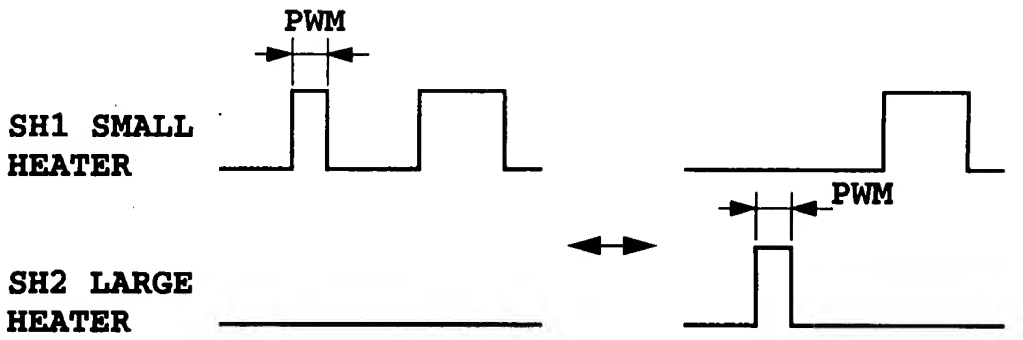


FIG.36A

(FOR MEDIUM EJECTION AMOUNT MODE)

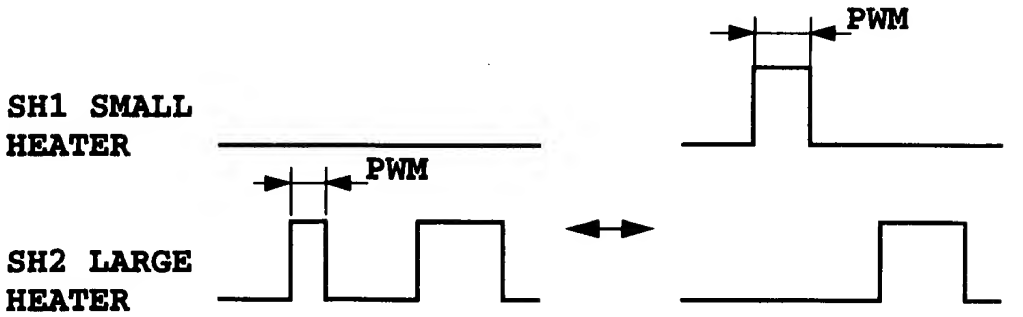


FIG.36B

(FOR LARGE EJECTION AMOUNT MODE)

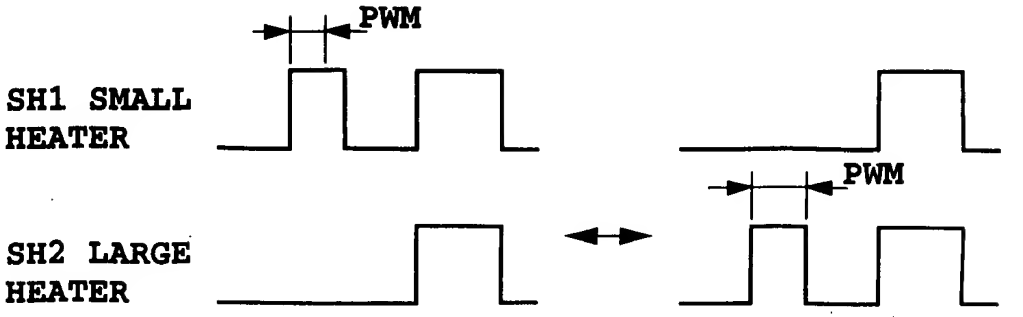


FIG.36C

OFF TIME P_2 TABLE FOR SMALL EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER OFF TIME (μsec)	4.0	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2
LARGE HEATER OFF TIME (μsec)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(15pl)

FIG.37A

OFF TIME P_2 TABLE FOR MEDIUM EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER OFF TIME (μsec)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LARGE HEATER OFF TIME (μsec)	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6	0.4

(25pl)

FIG.37B

EP 0 788 882 A2

OFF TIME P_2 TABLE FOR LARGE EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER OFF TIME (μsec)	4.0	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2
LARGE HEATER OFF TIME (μsec)	4.0	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2

(40pl)

FIG.37C

(FOR SMALL EJECTION AMOUNT MODE)

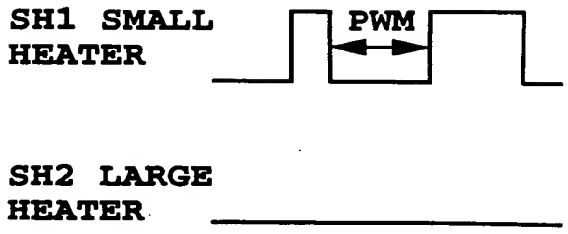


FIG.38A

(FOR MEDIUM EJECTION AMOUNT MODE)

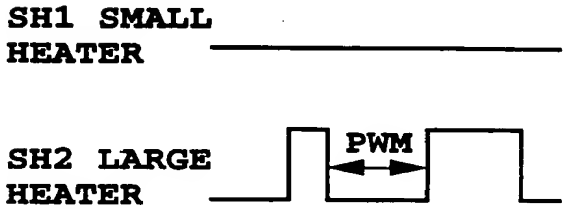


FIG.38B

(FOR LARGE EJECTION AMOUNT MODE)

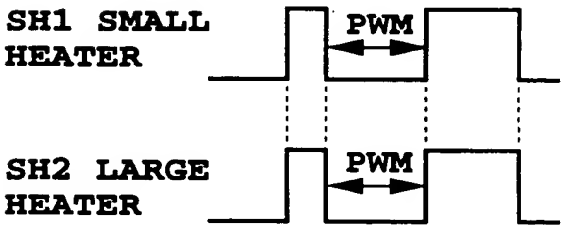


FIG.38C

OFF TIME P_2 TABLE FOR SMALL EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER OFF TIME (μsec)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LARGE HEATER OFF TIME (μsec)	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6	0.4

(15pl)

FIG.39A

OFF TIME P_2 TABLE FOR MEDIUM EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER OFF TIME (μsec)	4.0	3.6	3.2	2.8	2.4	2.0	1.6	1.2	0.8	0.4	0								
LARGE HEATER OFF TIME (μsec)	-	-	-	-	-	-	-	-	-	-	-								

(25pl)

FIG.39B

OFF TIME P_2 TABLE FOR LARGE EJECTION AMOUNT MODE

HEAD T TEMPERATURE (℃)	~26	~28	~30	~32	~34	~36	~38	~40	~42	~44	~46	~48	~50	~52	~54	~56	~58	~60	60~
SMALL HEATER OFF TIME (μsec)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
LARGE HEATER OFF TIME (μsec)	4.0	3.7	3.5	3.4	3.3	3.25	3.2	3.15	3.1	3.05	3.0	2.95	2.9	2.85	2.8	2.75	2.7	2.65	2.6

(40pl)

FIG.39C

(FOR SMALL EJECTION AMOUNT MODE)

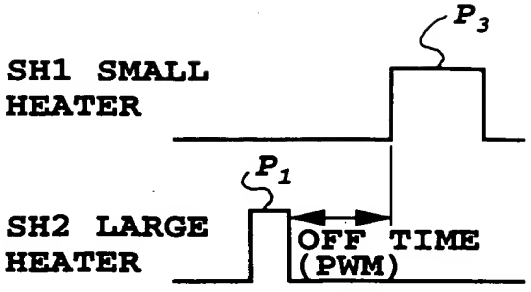


FIG.40A

(FOR MEDIUM EJECTION AMOUNT MODE)

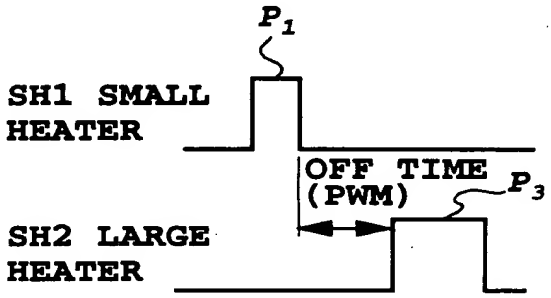


FIG.40B

(FOR LARGE EJECTION AMOUNT MODE)

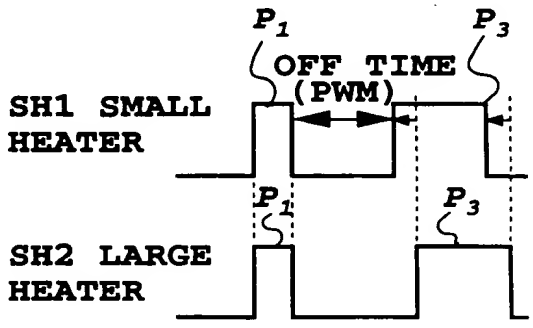


FIG.40C

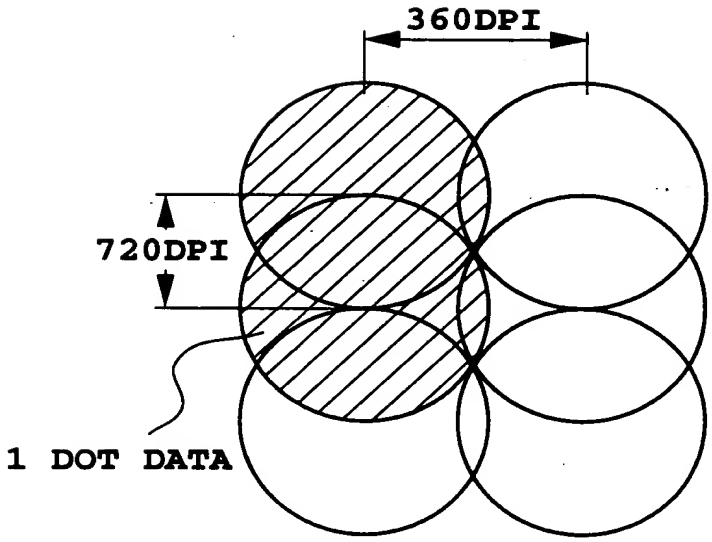


FIG.41

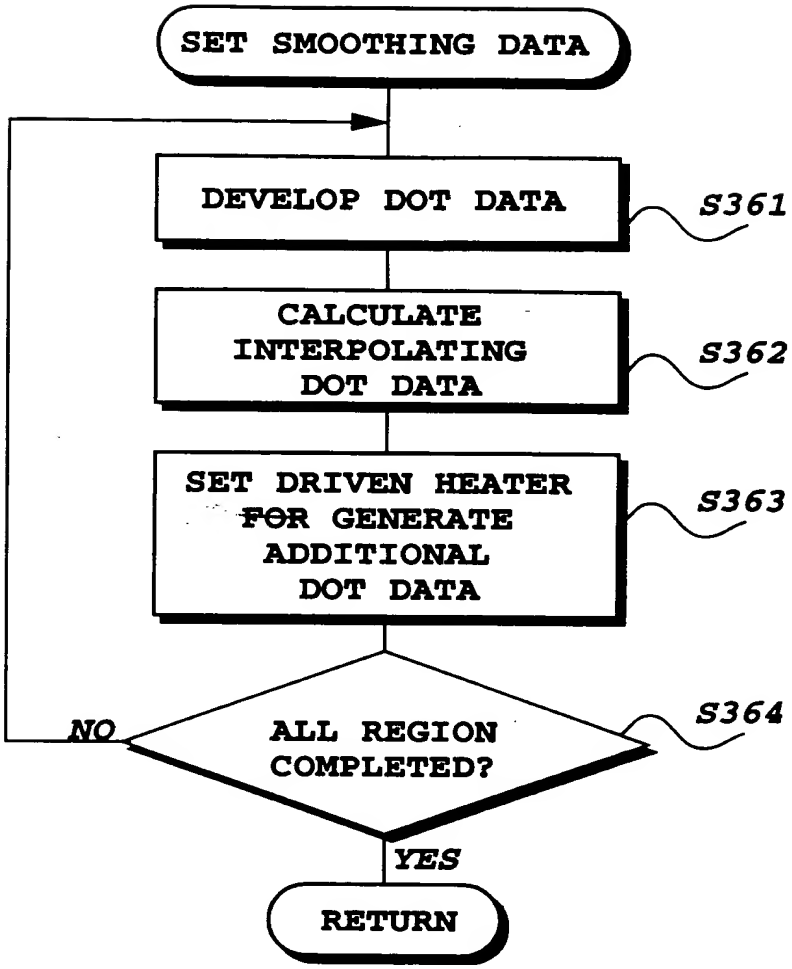

SET SMOOTHING DATA
DEVELOP DOT DATA
S361
CALCULATE INTERPOLATING DOT DATA
S362
SET DRIVEN HEATER FOR GENERATE ADDITIONAL DOT DATA
S363
ALL REGION COMPLETED?
S364
NO
YES
RETURN

FIG.42

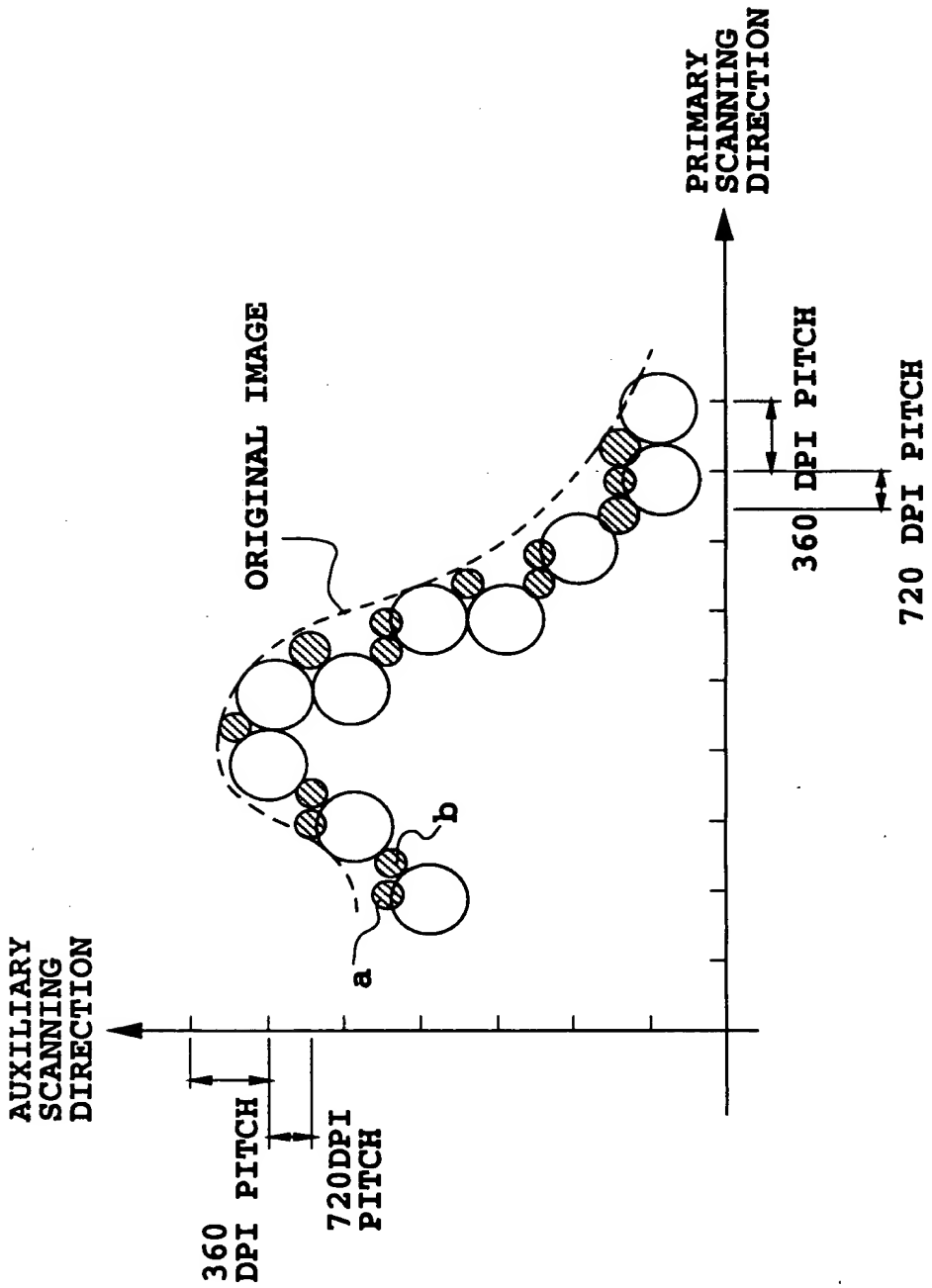

AUXILIARY SCANNING DIRECTION
PRIMARY SCANNING DIRECTION
ORIGINAL IMAGE
a
b
360 DPI PITCH
720DPI PITCH
360 DPI PITCH
720 DPI PITCH

FIG.43

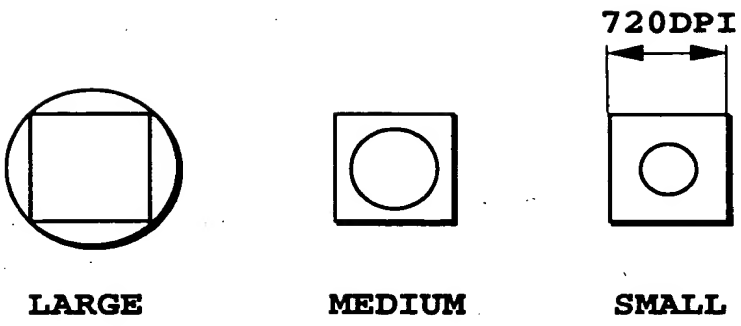


FIG.44

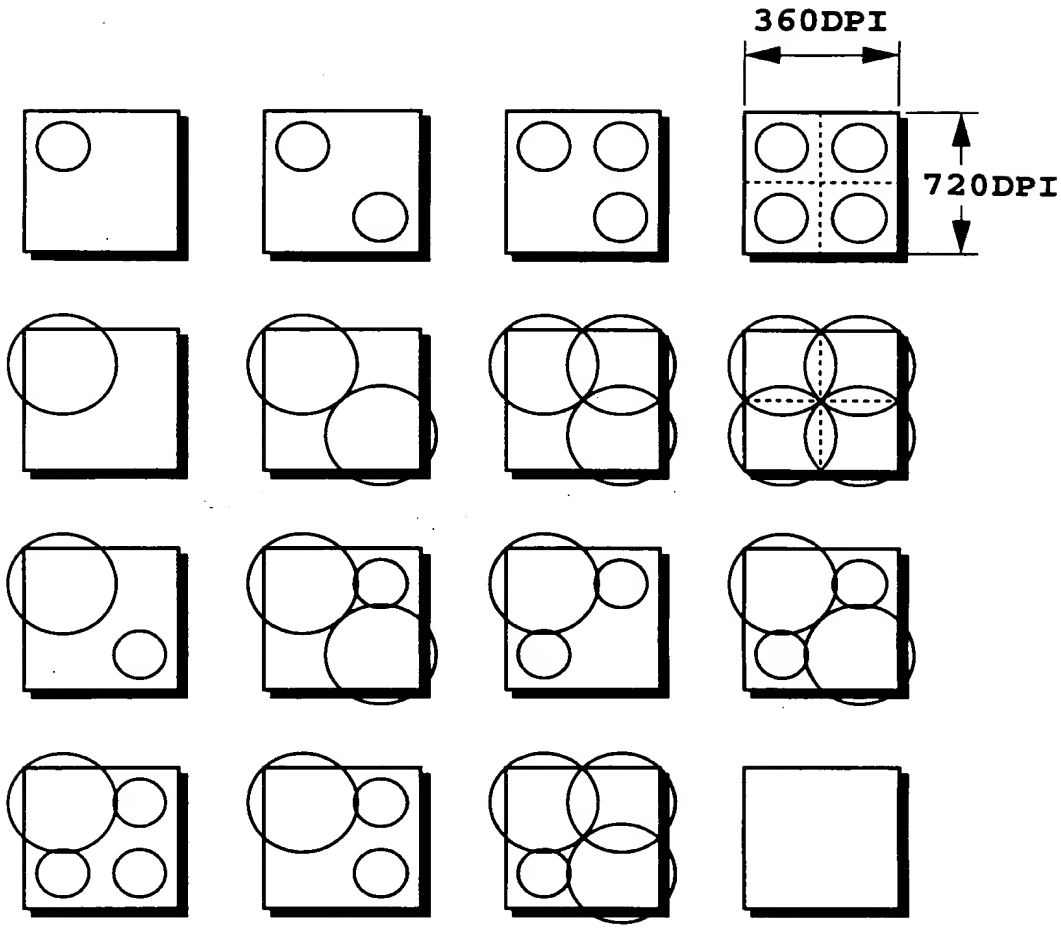


FIG.45

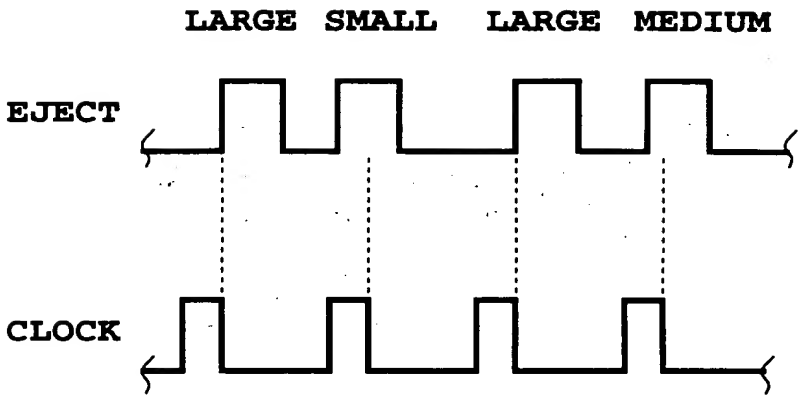


FIG.46A

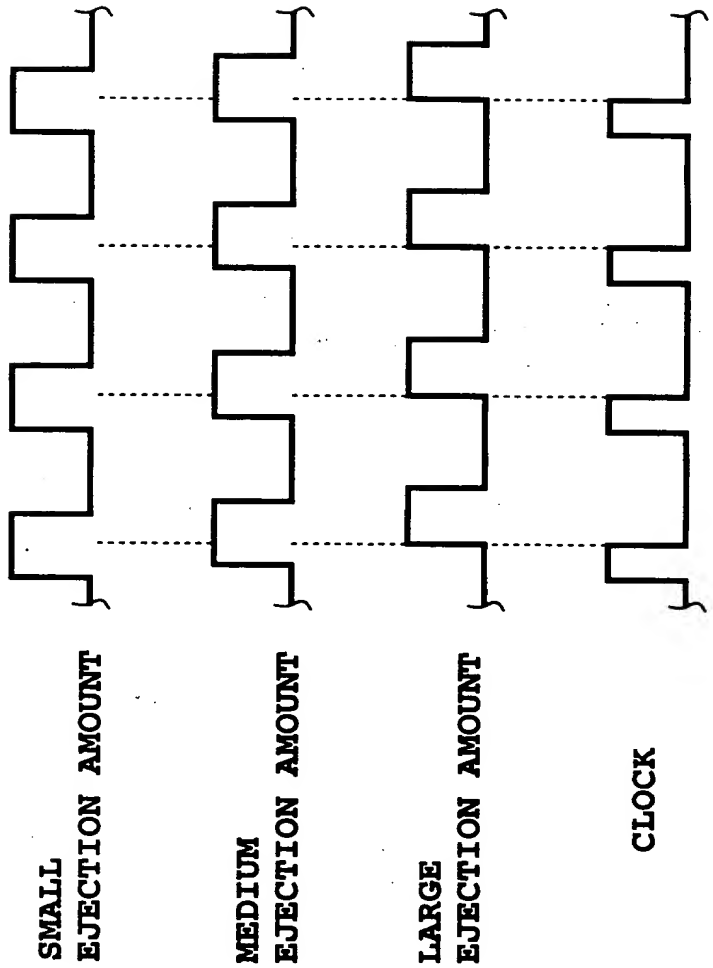
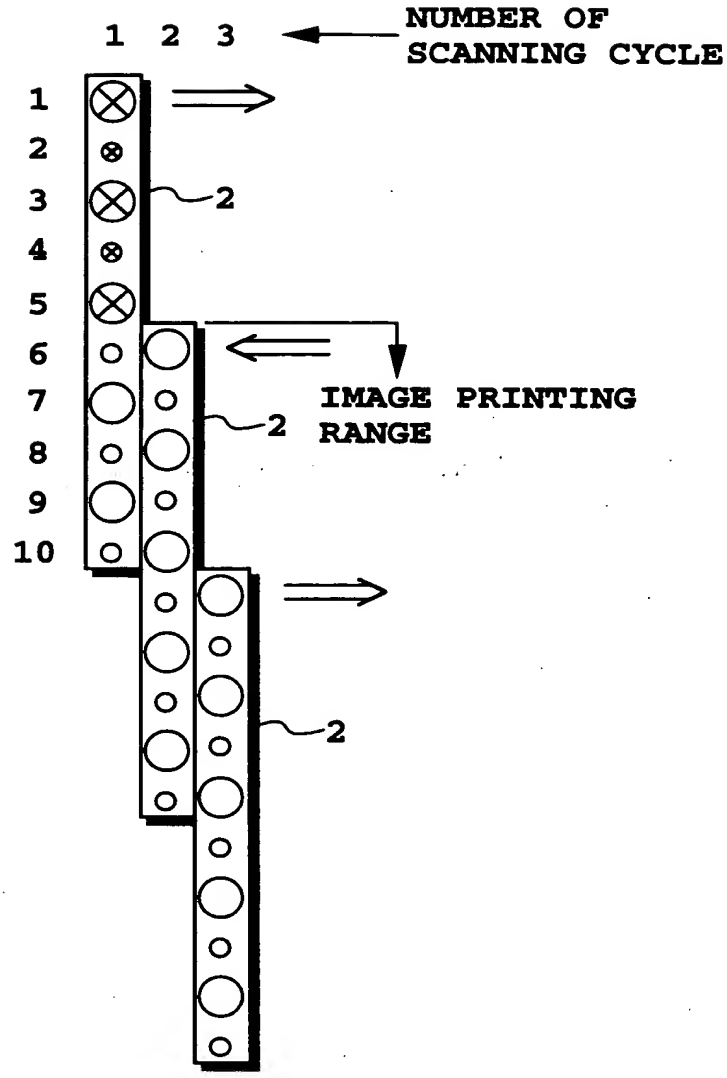

SMALL
EJECTION AMOUNT
MEDIUM
EJECTION AMOUNT
LARGE
EJECTION AMOUNT
CLOCK

FIG.46B



5, 5, · · · · · · 5 EQUAL FEEDING OF EJECTION OPENING WIDTH

FIG.47

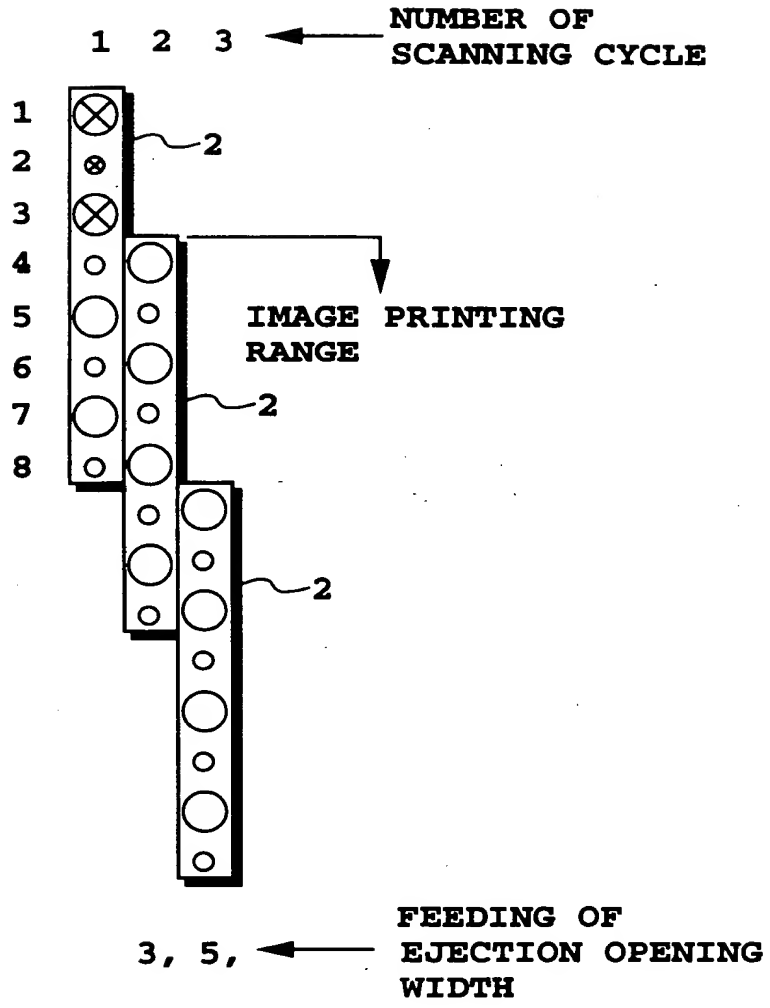

1 2 3
NUMBER OF SCANNING CYCLE
1
2
3
4
5
6
7
8
2
IMAGE PRINTING RANGE
2
2
3, 5,
FEEDING OF EJECTION OPENING WIDTH

FIG.48

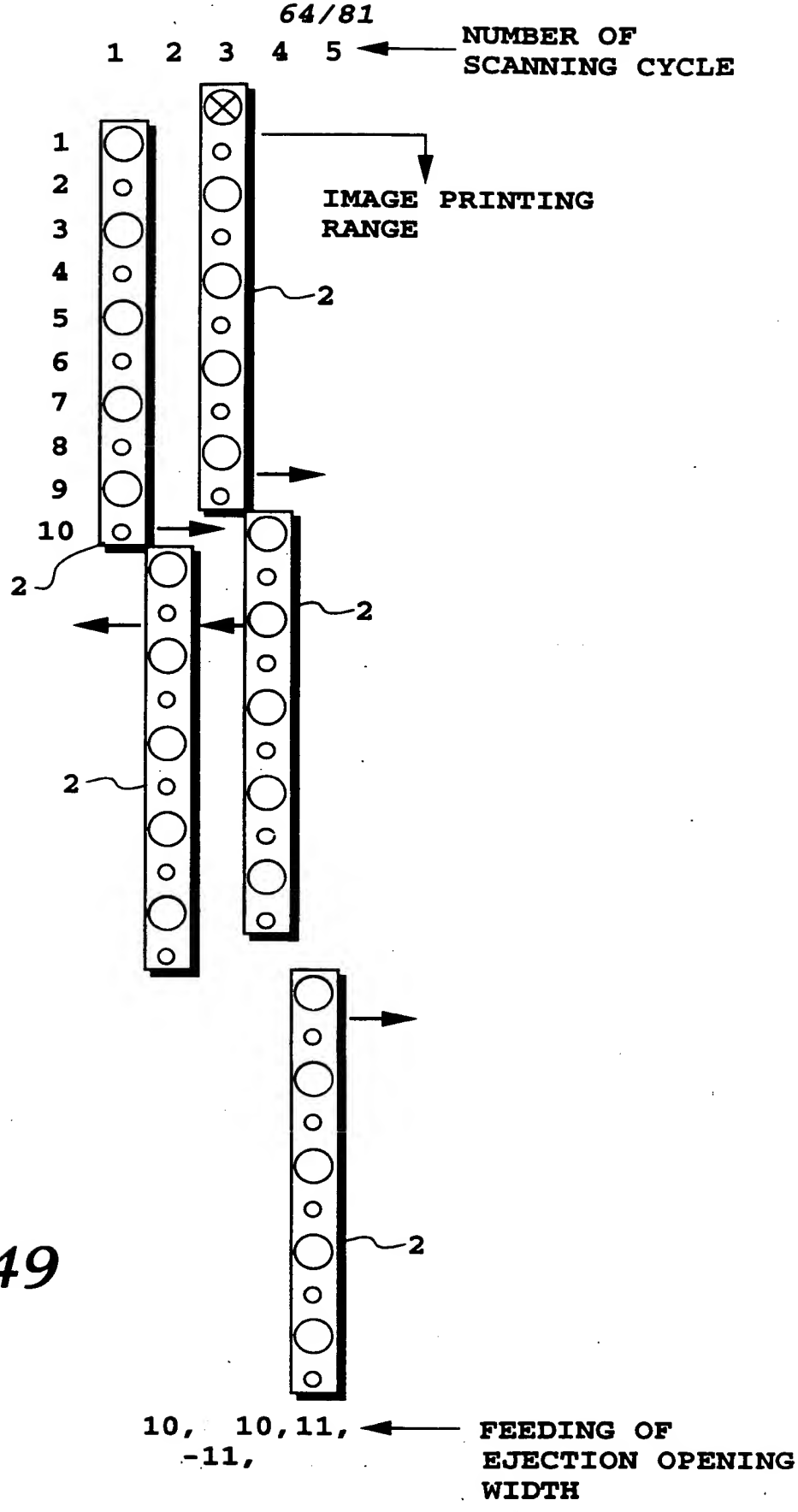

1 2 3 4 5
NUMBER OF SCANNING CYCLE
1
2
3
4
5
6
7
8
9
10
IMAGE PRINTING RANGE
2
2
2
2
10, 10,11, -11,
FEEDING OF EJECTION OPENING WIDTH

FIG.49

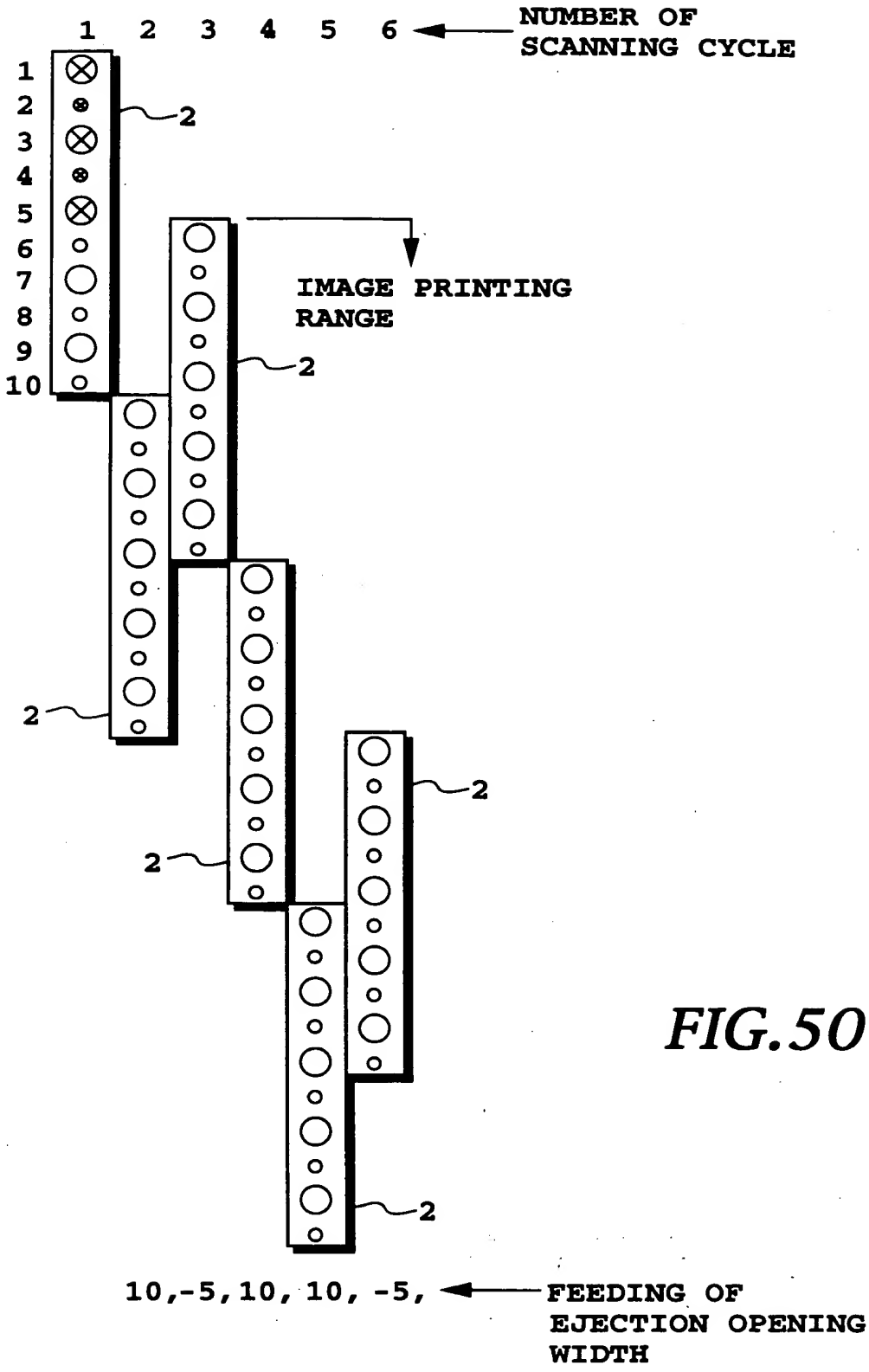

1 2 3 4 5 6
NUMBER OF SCANNING CYCLE
1
2
3
4
5
6
7
8
9
10
2
IMAGE PRINTING RANGE
2
2
2
2
10,-5,10, 10, -5,
FEEDING OF EJECTION OPENING WIDTH

FIG.50

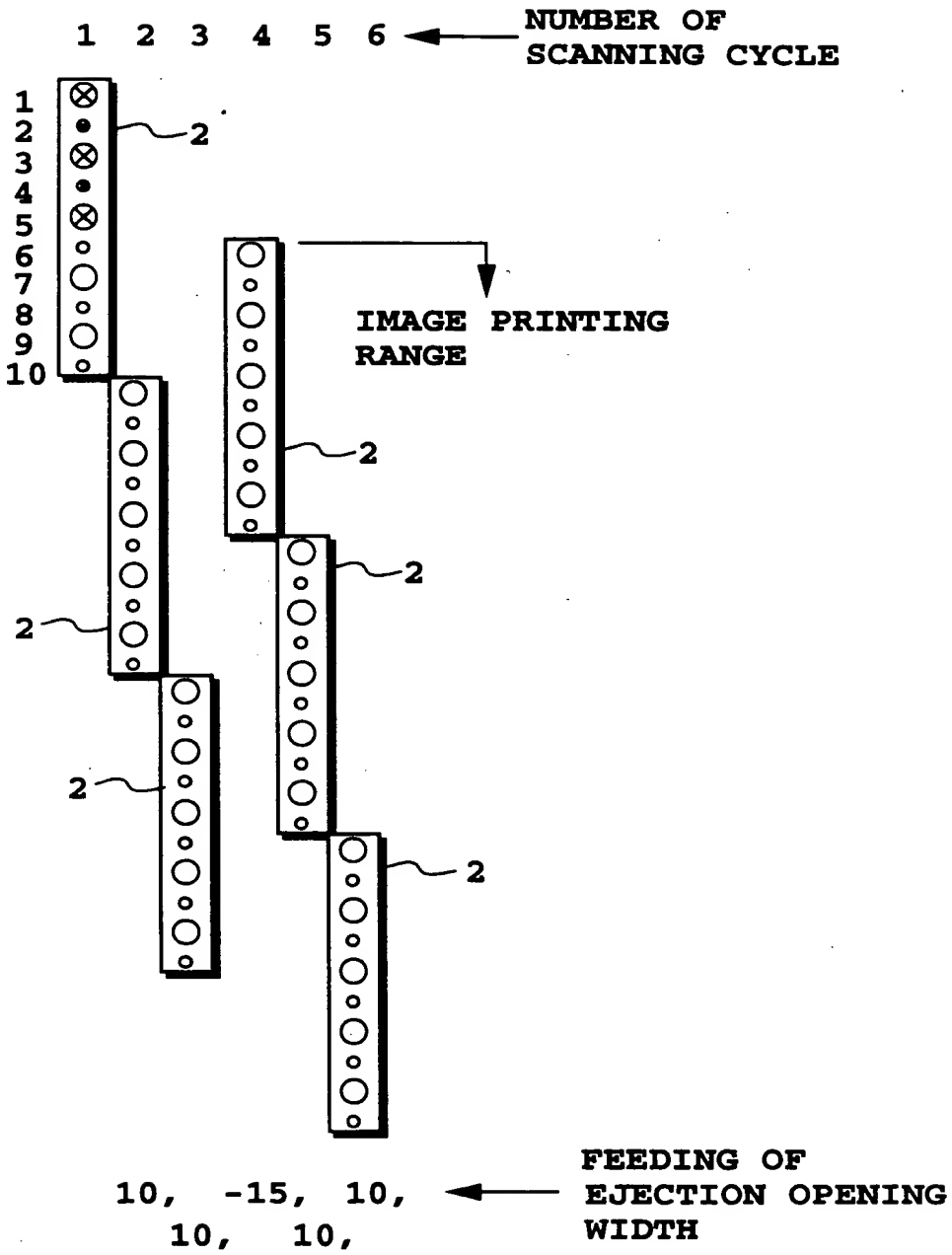

1 2 3 4 5 6
NUMBER OF SCANNING CYCLE
1
2
3
4
5
6
7
8
9
10
2
IMAGE PRINTING RANGE
2
2
2
2
2
10, -15, 10,
10, 10,
FEEDING OF EJECTION OPENING WIDTH

FIG.51

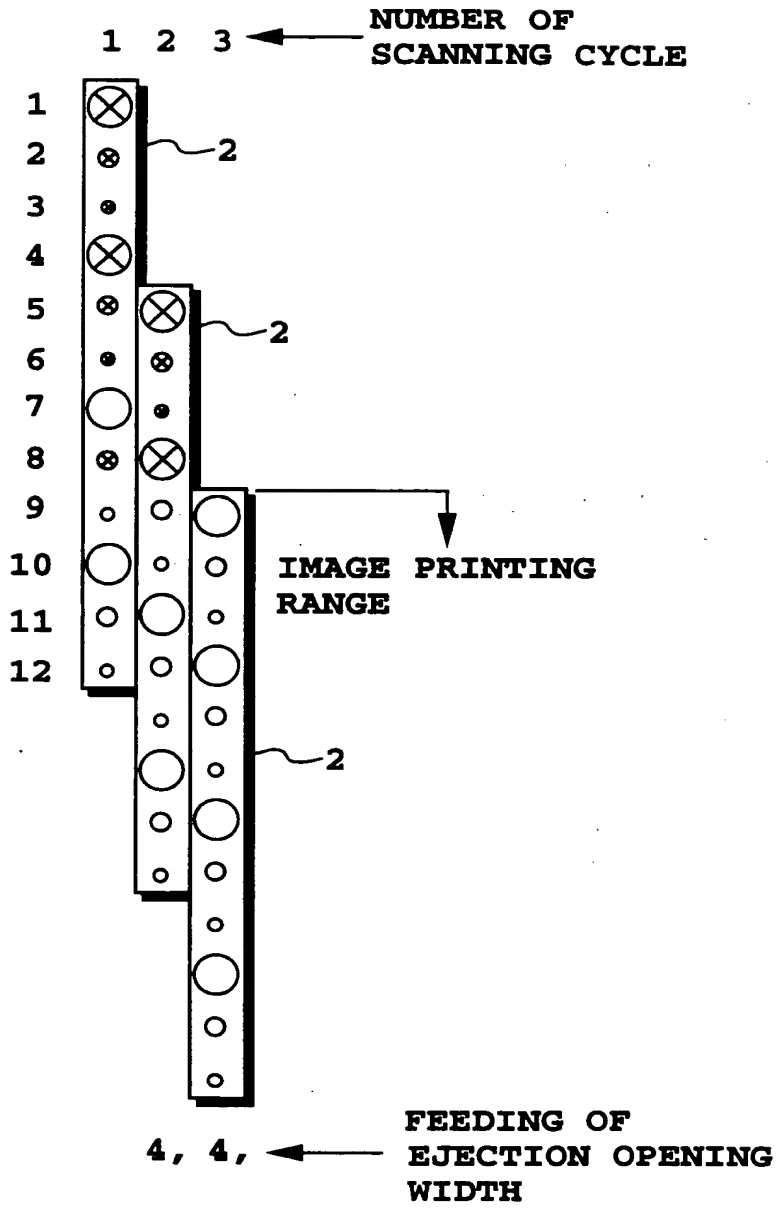

1 2 3
NUMBER OF SCANNING CYCLE
1
2
3
4
5
6
7
8
9
10
11
12
2
2
2
IMAGE PRINTING RANGE
4, 4,
FEEDING OF EJECTION OPENING WIDTH

FIG.52

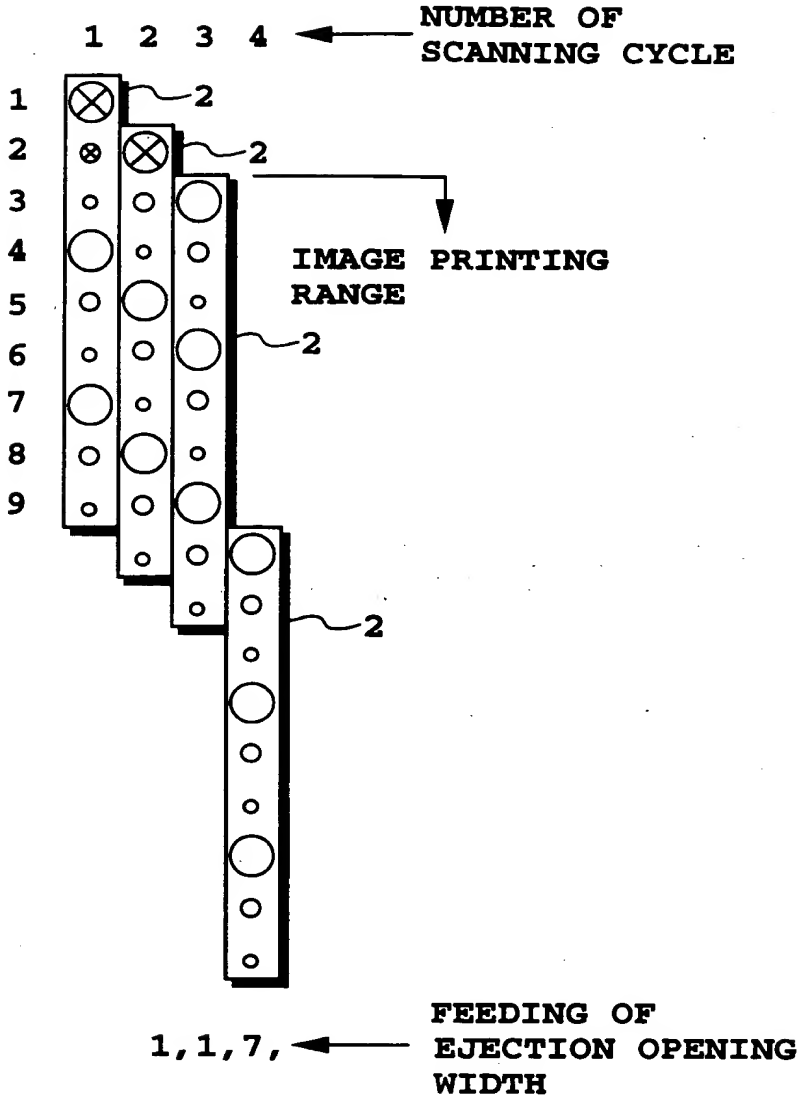

1 2 3 4
NUMBER OF SCANNING CYCLE
1
2
3
4
5
6
7
8
9
2
2
2
2
IMAGE PRINTING RANGE
1,1,7,
FEEDING OF EJECTION OPENING WIDTH

FIG.53

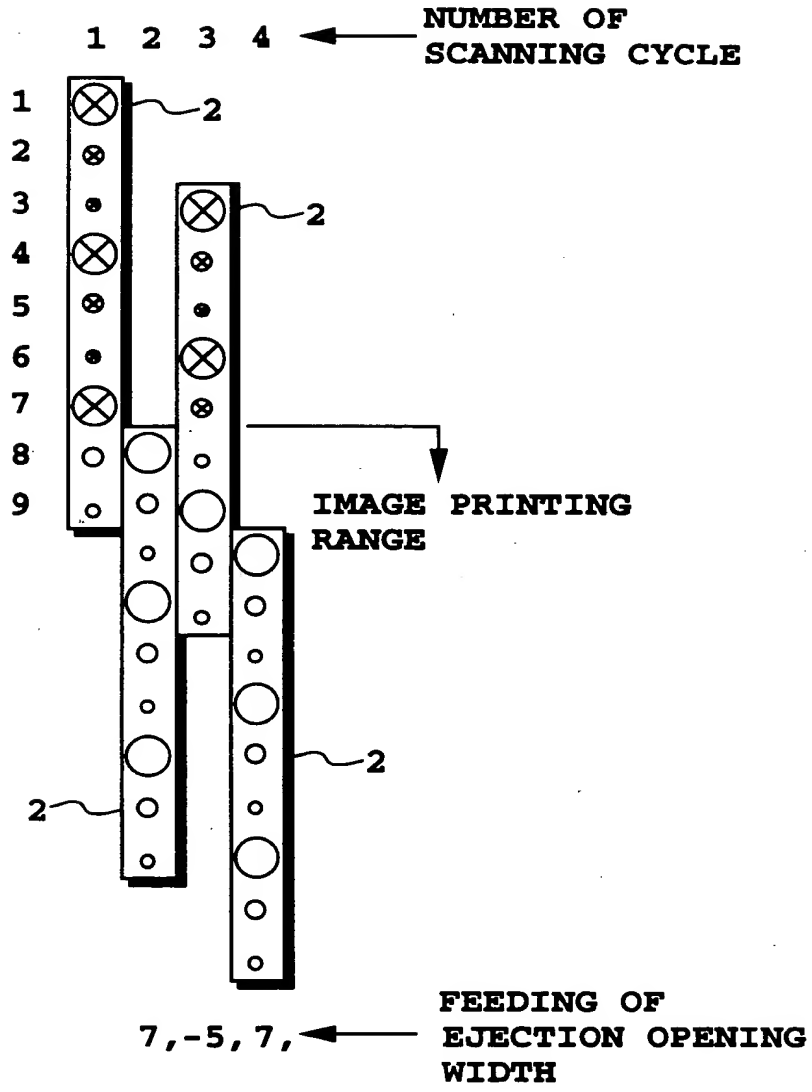

1 2 3 4
NUMBER OF SCANNING CYCLE
1
2
3
4
5
6
7
8
9
2
2
2
2
IMAGE PRINTING RANGE
7,-5,7,
FEEDING OF EJECTION OPENING WIDTH

FIG.54

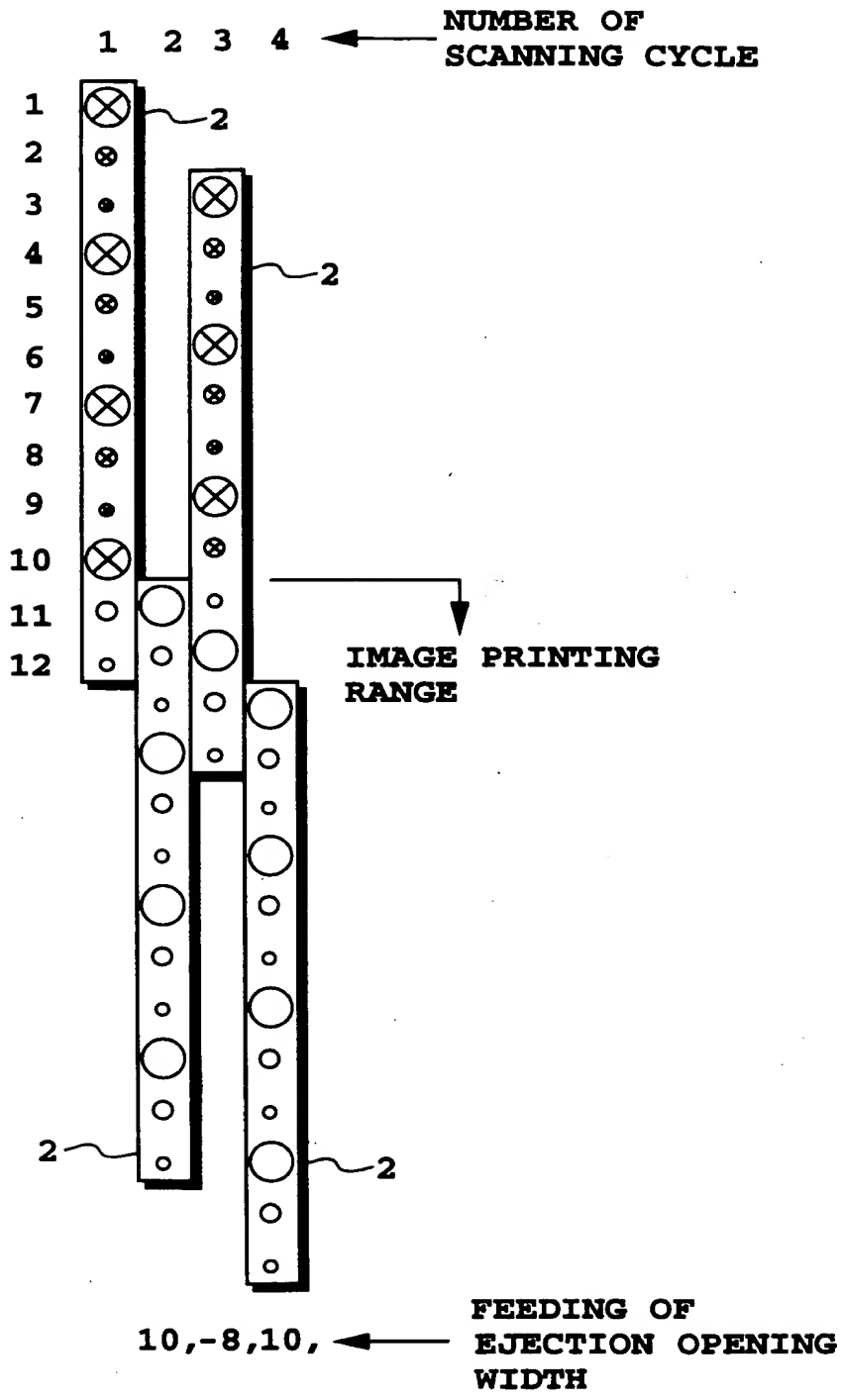

1 2 3 4
NUMBER OF SCANNING CYCLE
1
2
3
4
5
6
7
8
9
10
11
12
2
2
IMAGE PRINTING RANGE
2
2
10,-8,10,
FEEDING OF EJECTION OPENING WIDTH

FIG.55

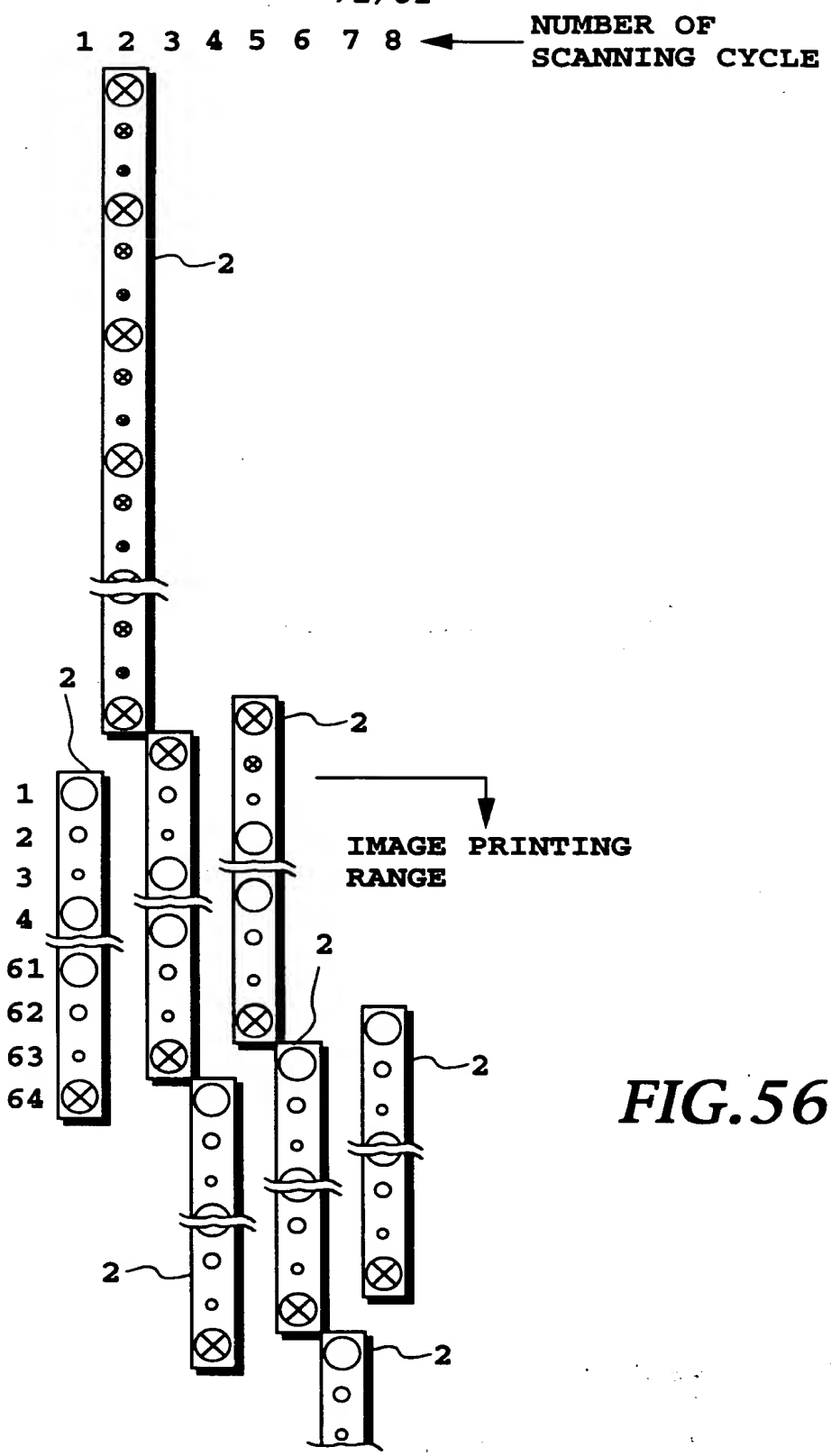

1 2 3 4 5 6 7 8
NUMBER OF SCANNING CYCLE
2
2
2
1
2
3
4
61
62
63
64
IMAGE PRINTING RANGE
2
2
2
2

FIG.56

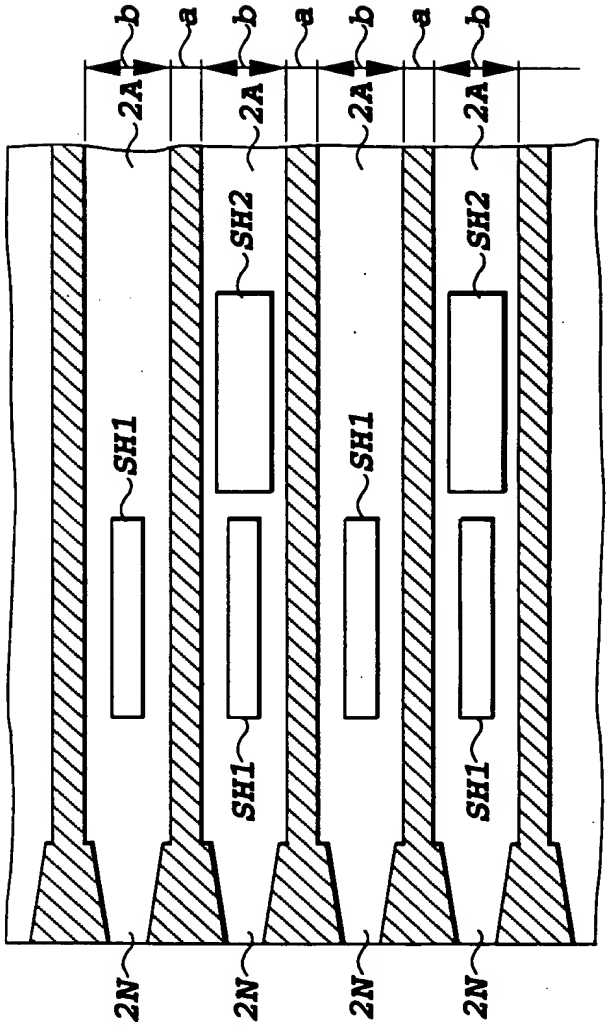


FIG.57A

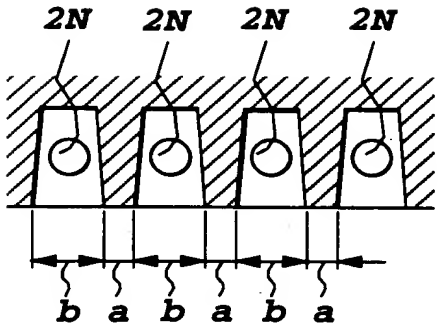


FIG.57B

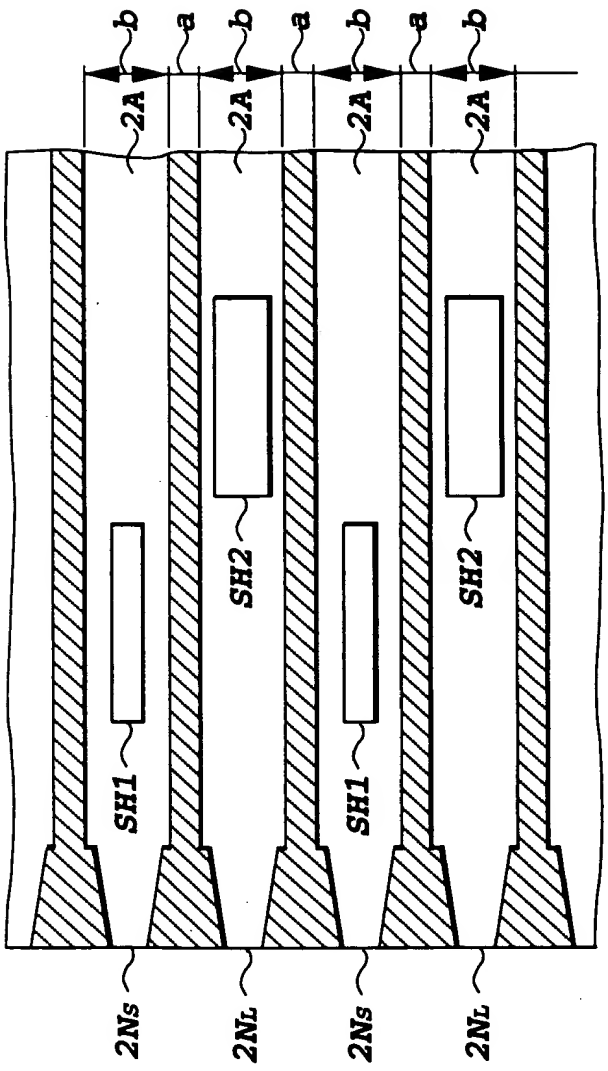


FIG.58A

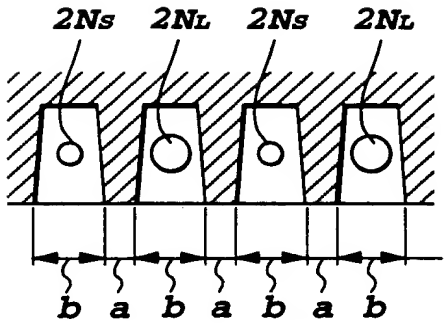


FIG.58B

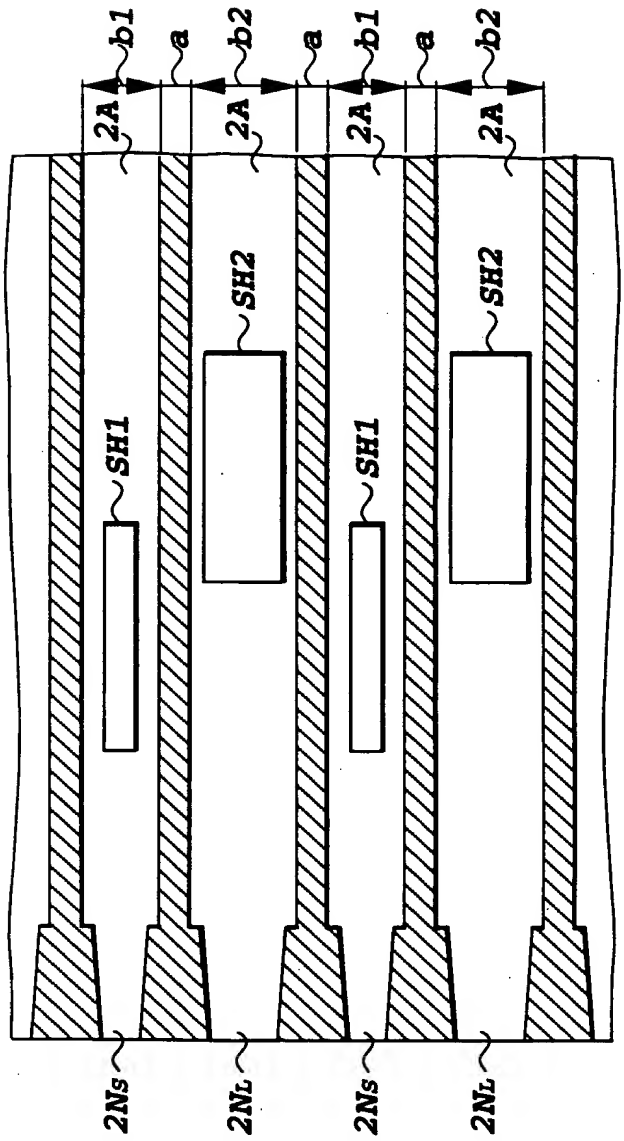


FIG.59A

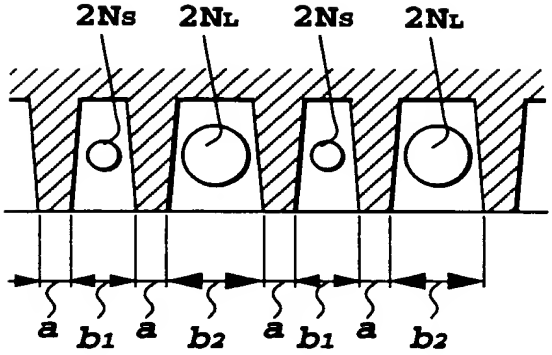


FIG.59B

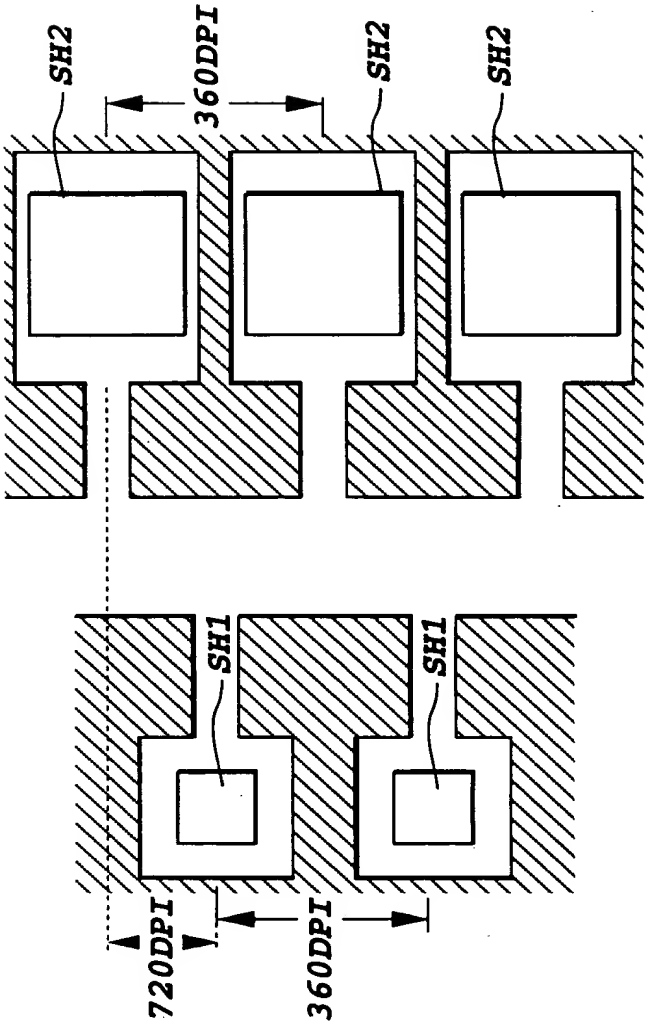


FIG.60A

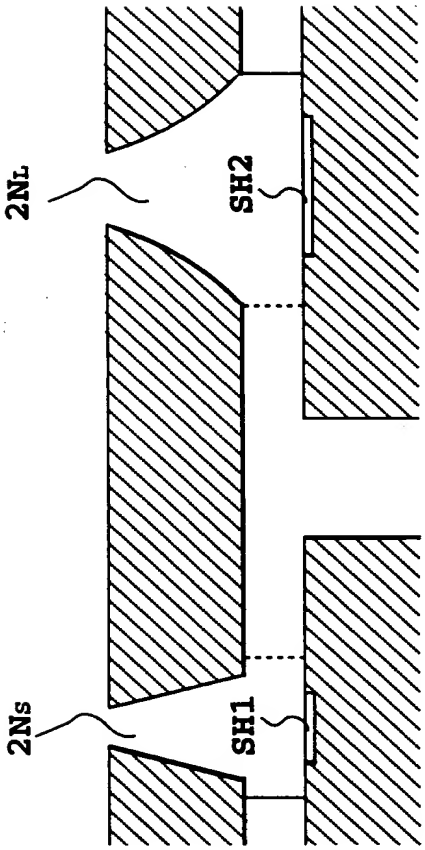


FIG.60B

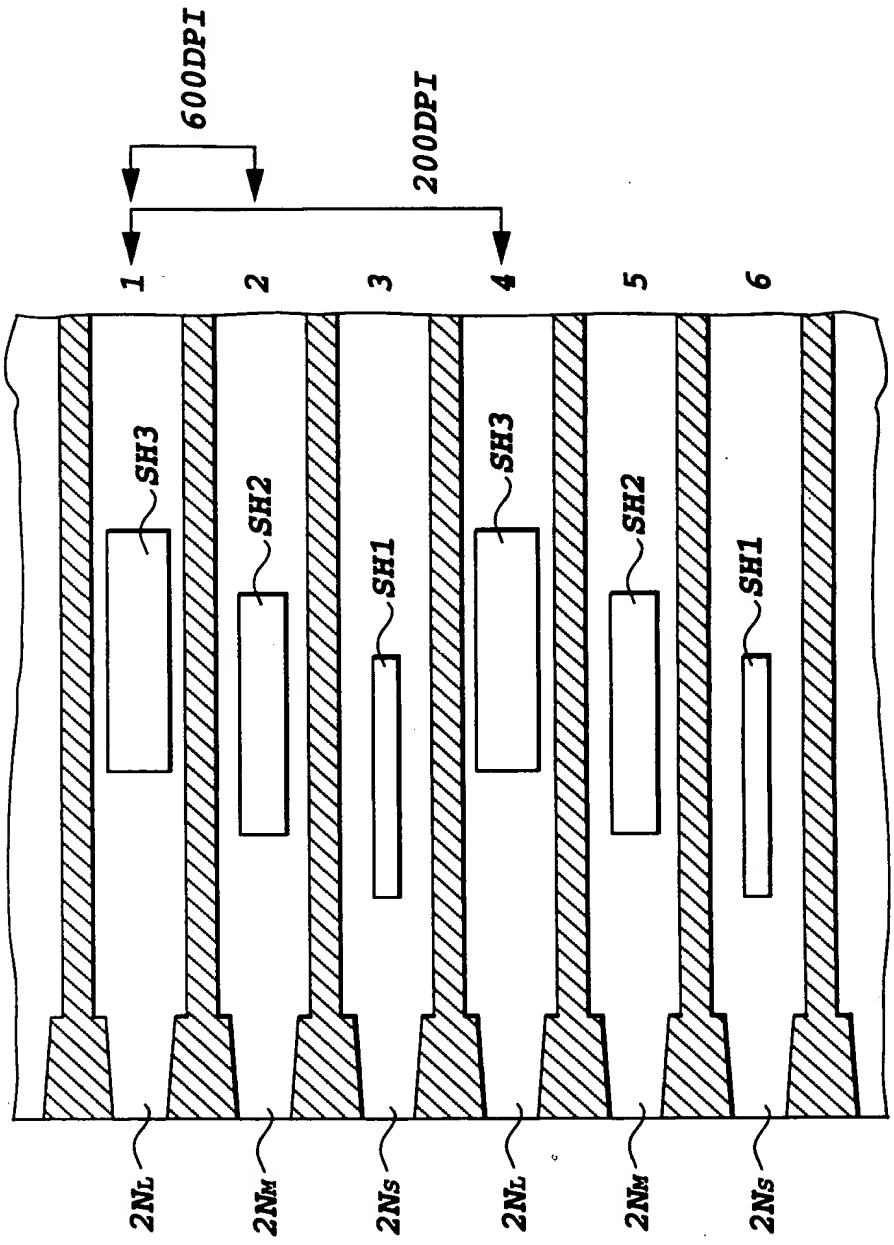

600DPI
200DPI
1
2
3
4
5
6
SH3
SH2
SH1
SH3
SH2
SH1
2NL
2NM
2NS
2NL
2NM
2NS
1 2 3 4 5 6

FIG.61

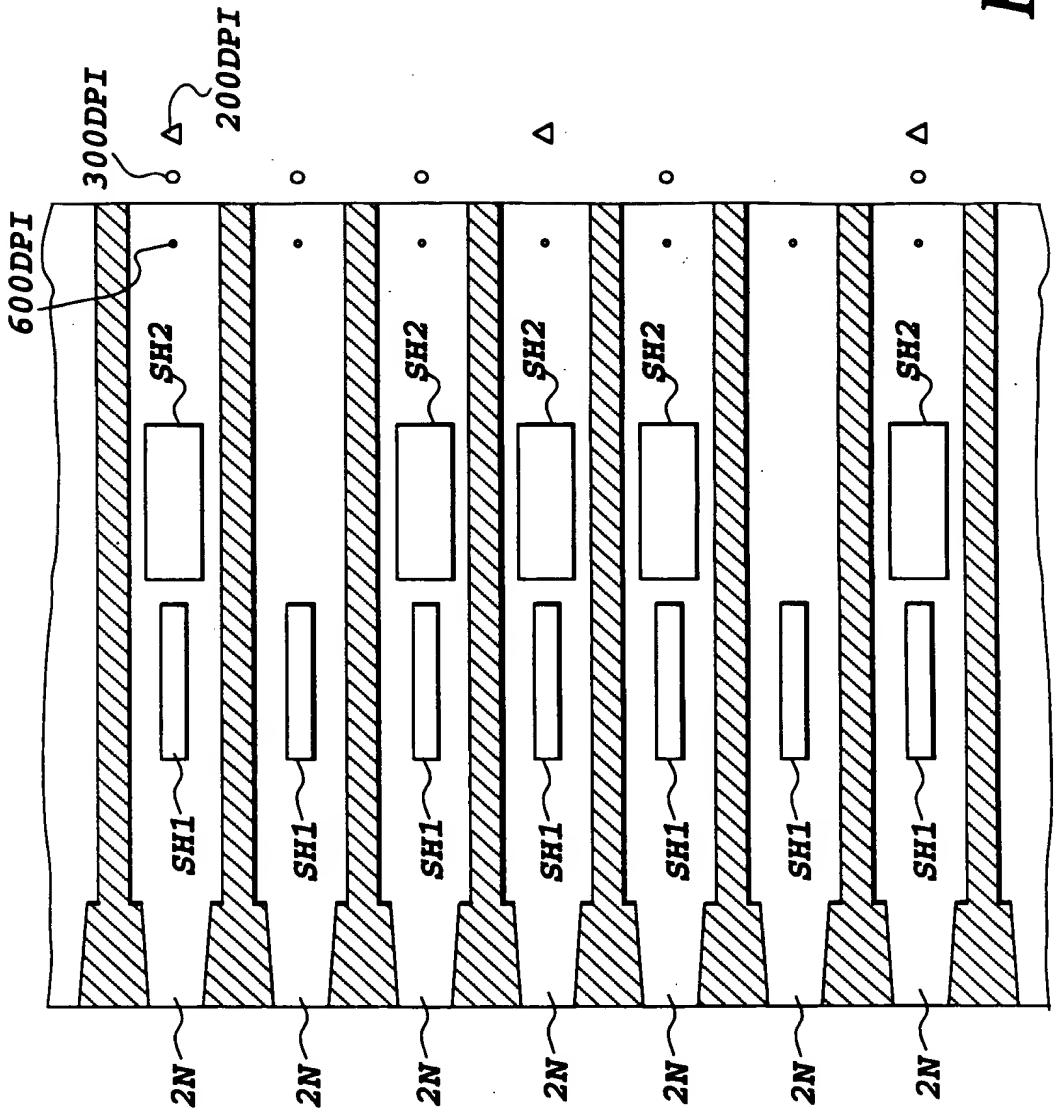


FIG.62